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(Original Official Organ U. S. Vet. Med. Assn.)

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No. 6

PRESIDENT BRUMLEY FROM COAST TO COAST

Dr. Brumley already has a good start on his peregrinations as President of the American Veterinary Medical Association and, at the rate at which he is going, it is quite probable that he will equal or even surpass the records established by several past presidents of the A. V. M. A. in recent years.

The first week in October found our President in New England, where he attended the annual meeting of the New England Veterinary Medical Association, in Portland, Maine, October 4-5. The following evening, Dr. Brumley attended and addressed the regular monthly meeting of the Veterinary Medical Association of New York City. While in the metropolis, he took advantage of the opportunity to attend a number of sessions of the annual meeting of the American Public Health Association, which met October 5-8.

The next meeting attended by President Brumley was the annual convention of the Southern States Veterinary Medical Association, in Atlanta, Ga., October 14-15-16. This visit of an A. V. M. A. president to a meeting of the Southern States marked the 16th consecutive meeting attended by either the President or the Secretary of the A. V. M. A.

The last week in November found our President in Chicago, attending a number of meetings. These included the semi-annual meeting of the Executive Board of the A. V. M. A., the annual meeting of the United States Live Stock Sanitary Association and the annual banquet of the National Association of Bureau of Animal Industry Veterinarians. It has become an established custom of the latter organization to have the President of the A. V. M. A. as a banquet speaker each year.

During the month of December, Dr. Brumley will attend meetings of two state associations. He will go to Grand Island, to meet with the Nebraska veterinarians, on December 14-15, and from there he will go to Sioux Falls, to fraternize with the South Dakota veterinarians, on December 16-17.

The last day of December will find President Brumley in Los Angeles, where he will attend a joint meeting of the Southern California Veterinary Medical Association and the Veterinary Hospital Association of Southern California. Then, after viewing the Tournament of Roses on New Year's Day, he will go to the University Farm, at Davis, for the meeting of the California State Veterinary Medical Association and University of California Veterinary Conference. Starting back east, he will stop off at Ogden, Utah, about January 7-8, for the annual meeting of the Intermountain Livestock Sanitary Association. His next stop will be Minneapolis, January 10-11, where he will be on the program of the Minnesota State Veterinary Medical Society.

After being home for a few days, President Brumley will resume his itinerary. He will attend the annual meeting of the Ohio State Veterinary Medical Association, in Columbus, January 20-21, and then go to East Lansing, to participate in the Michigan State College Short Course for Veterinarians, which is scheduled for the week of January 24.

This will be the last meeting attended until the latter part of February, when our President will proceed to Auburn, Ala., where he will assist Dean McAdory in putting on the annual Short Course for Graduate Veterinarians and attend the meeting of the Alabama Veterinary Medical Association, the latter part of the week. Then he will proceed to Baton Rouge, where he will attend the meeting of the Louisiana Veterinary Medical Association and the Louisiana State University Short Course, March 2-3.

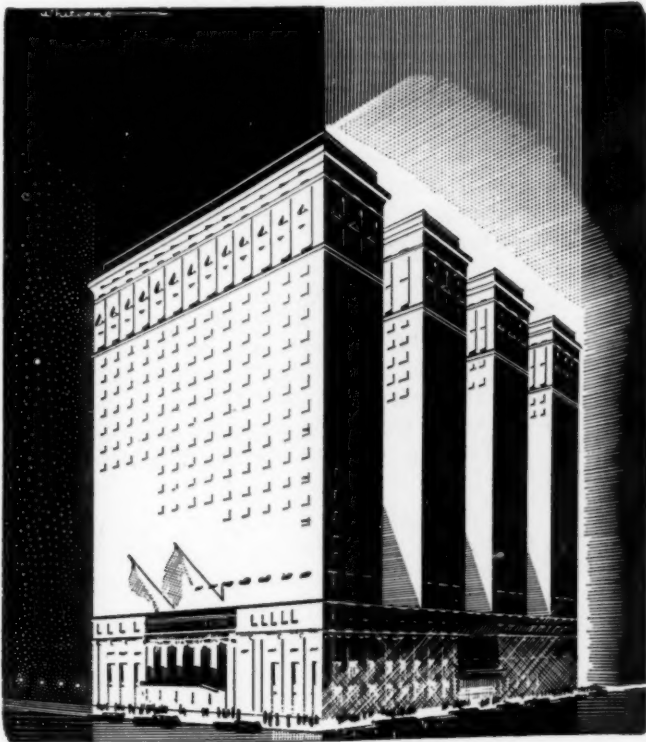
It is quite possible that President Brumley may be able to squeeze in another meeting or two some time during the next few months, but no definite plans have been made for his at-

tendance at any meetings other than those mentioned in these paragraphs.

HOTEL PENNSYLVANIA OFFICIAL HEADQUARTERS

Dr. H. W. Jakeman, Chairman of the Executive Board; Mr. G. P. Snow, representing the Veterinary Exhibitors' Association, and the Secretary of the A. V. M. A., the special committee of the Executive Board appointed to select a hotel in New York City for the 1938 convention of the American Veterinary Medical Association, July 5, 6, 7, 8, 9, met in New York on November 8 and, after making a thorough inspection of five hotels that had been suggested, decided that the Hotel Pennsylvania offered the most adequate facilities, everything considered.

The Hotel Pennsylvania contains 2,200 rooms, and the following rates will prevail during the convention:



HOTEL PENNSYLVANIA, NEW YORK CITY

Single rooms	From \$3.50
Double-bed rooms for two.....	From 5.00
Twin-bed rooms for two.....	From 6.00

The management has guaranteed to assign every one immediately upon arrival and at any rate within their price range. This means that the minimum rates will be given to all, if requested.

Ample facilities for holding the various meetings, alumni dinners, the banquet and the clinic will be available. The exhibits will be placed in such a way so that these will be convenient to the Ball Room, where the general sessions will be held. All meeting rooms and all dining rooms at the Pennsylvania are air-conditioned.

EXECUTIVE BOARD IN SESSION

While the members of the Executive Board of the A. V. M. A. were in session at the LaSalle Hotel, in Chicago, on November 28, one member remarked that it would be a good idea to have a picture taken while all thirteen members of the Board were together. It was found that the picture could not be taken until the following day. When the photographer arrived, the Board was engaged in discussing plans for the New York Diamond Jubilee convention. Dr. Cassius Way, chairman of the Committee on Local Arrangements, was present, as well as Treasurer Jacob and Attorney Kotz, so it was decided to have a picture of what might be well called the "A.V.M.A. Official Family." The picture appears on the opposite page. Those in the group are:

Back row (left to right): Dr. L. J. Allen, Oklahoma City, Okla. (District 8); Dr. F. A. Zimmer, Columbus, Ohio (District 10); Dr. Cassius Way, New York, N. Y., chairman of the Committee on Local Arrangements for the New York meeting; Dr. William Moore, Raleigh, N. C. (District 4); Dr. Chas. W. Bower, Topeka, Kan., Member-at-Large; Dr. E. P. Althouse, Sunbury, Pa. (District 2); Dr. I. E. Newson, Fort Collins, Colo. (District 6).

Middle row: Dr. W. A. Sullivan, Cheyenne, Wyo. (District 7); Dr. L. A. Merillat, Chicago, Ill. (District 3); Mr. Joseph M. Kotz, Legal Counsel; Miss A. Harrington, private secretary to Dr. Hoskins; Dr. H. Preston Hoskins, Secretary-Editor; Dr. A. E. Cameron, Ottawa, Ont. (District 1); Dr. H. C. H. Kernkamp, Saint Paul, Minn. (District 5).

Front row: Dr. Harry W. Jakeman, Boston, Mass., Chairman of the Board; Dr. Oscar V. Brumley, Columbus, Ohio, President; Dr. H. D. Bergman, Ames, Iowa, President-Elect; Dr. M. Jacob, Knoxville, Tenn., Treasurer.



THE A. V. M. A. OFFICIAL FAMILY

EXECUTIVE BOARD ELECTION

The polls for the primary in the special election for member of the Executive Board of the A. V. M. A. for District 7 were closed following the delivery of the last mail on November 15. The nominating ballots were canvassed the following day and it was found that 187 members had voted. This number of ballots bore the names of 34 different nominees. The ballots for the election proper were prepared and placed in the mail under date of November 17. The ballots carried the names of the following candidates:

LYTLE, W. H.

Salem, Ore.

State Veterinarian of Oregon. Graduate, Iowa State College, 1902. Joined A. V. M. A., 1910. Member of Committee on Army Service, 1918-19. Member of Committee on Veterinary Biological Products, 1924-25. Secretary (1927-28, 1929-31) and chairman (1931-33) of Section on Sanitary Science and Food Hygiene. Resident secretary for Oregon, 1928-29 and 1931-33. Member of Committee on Program, 1929-31.

SIMMS, B. T.

Corvallis, Ore.

Professor of Veterinary Medicine, Oregon State College. Graduate, Alabama Polytechnic Institute, 1911. Joined A. V. M. A., 1912. Resident secretary for Oregon, 1916-24 and 1936. Member (1919-23, 1924-25, 1926-28) and chairman (1923-24, 1925-26) of Committee on Intelligence and Education. Chairman of Committee on Local Arrangements, Portland meeting, 1924-25. First vice-president, 1927-28; fourth vice-president, 1930-31. Chairman of Committee on Resolutions, 1928-31. Member of Committee on International Veterinary Congress, 1931-34. Secretary of Section on Research, 1933-35. Member of Committee on Program, 1933-35.

SPENCER, W. T.

Omaha, Neb.

Commissioner, Omaha Live Stock Exchange. Graduate, Kansas City Veterinary College, 1907. Joined A. V. M. A., 1917. Resident secretary for Nebraska, 1921-22. Member of International Commission on Bovine Tuberculosis, 1921-23. Member of Committee on Resolutions, 1929-31. Member of Special Committee on Commercial Slaughter-Houses, 1931-32. Chairman of Committee on Local Arrangements, Omaha meeting, 1936-37. Fourth vice-president, 1937.

SULLIVAN, W. A.

Cheyenne, Wyo.

U. S. B. A. I. Inspector-in-Charge. Graduate, McKillip Veterinary College, 1907. Joined A. V. M. A., 1909. Resident secretary for Idaho, 1919-20 and 1924-31.

WEGNER, E. E.

Pullman, Wash.

Dean, College of Veterinary Medicine, State College of Washington. Graduate, State College of Washington, 1908. Joined A. V. M. A., 1913. Member of Committee on Local Arrangements, Portland meeting, 1924-25. Member of Committee on Resolutions, 1924-25 and 1929-30. First vice-president, 1925-26. Resident secretary for Washington, 1928-29, 1935-36 and 1937-. Member of Committee on International Veterinary Congress, 1933-34.

APPLICATIONS FOR MEMBERSHIP

This month we are giving first listing to 14 applications, the last to be listed for the calendar year 1937. These 14 applications represent the crop for November, which usually is an off month as far as applications are concerned. Upon looking back over the records for the year 1937, we find that we have listed 451 applications in the twelve issues of the JOURNAL published this year. This is the largest number for any calendar year since 1929.

Do not forget the main reason for listing applicants for membership in the A. V. M. A. If you are already a member, it is your privilege to know who is seeking membership. It is also your privilege to object to the admission of an applicant if, in your opinion, he is not worthy. Look the list over each month.

(See July, 1937, JOURNAL)

FIRST LISTING

- CLAIR, JOSEPH E. Box 1086, Sacramento, Calif.
D. V. M., Kansas State College, 1930
Vouchers: Clarence J. Cook and P. E. Johnson.
- DINGWALL, STUART M. 214 N. 4th St., Grants Pass, Ore.
B. S., D. V. M., State College of Washington, 1937
Vouchers: E. F. Chastain and Emmett W. Cantrall.
- DOYLE, MAJ. EDWARD C. Cameron Highlands, Fed. Malay States
M. R. C. V. S., Royal College of Veterinary Surgeons, 1908
Vouchers: Alex Robertson and W. W. Dimock.
- FLACK, LT. GEORGE R. 2825 W. Somerset St., Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1936
Vouchers: Lt. Robert R. Altaker and Lt. Col. F. H. Woodruff.
- GASSNER, FRANK X. Colorado State College, Fort Collins, Colo.
D. V. M., Colorado State College, 1937
Vouchers: A. W. Deem and Frank Thorp, Jr.
- GEORGE, CEDRIC K. Lester Prairie, Minn.
D. V. M., Saint Joseph Veterinary College, 1921
Vouchers: Joab P. Foster and John S. Dick, Jr.
- HAGEMAN, EDWARD H. 4022 Wentworth Ave., Minneapolis, Minn.
B. V. Sc., Ontario Veterinary College, 1937
Vouchers: Joab P. Foster and Frederick W. Gehrman.
- HAYNES, CHARLES F. c/o Lexington Apts., Helena, Mont.
B. S., D. V. M., State College of Washington, 1934
Vouchers: G. W. Cronen and E. M. Joneschild.
- KINSLEY, ELMER F. 106 Grand Ave., Laramie, Wyo.
D. V. S., Kansas City Veterinary College, 1911
Vouchers: H. D. Port and W. A. Sullivan.
- PHELPS, ELTON T. Mapleton, Minn.
M. D. V., McKillip Veterinary College, 1908
Vouchers: Joab P. Foster and William C. Prouse.
- RATHORE, GOPAL S. 6, Haymarket, London S. W. 1, England
D. V. M., Kansas State College, 1936
Vouchers: R. R. Dykstra and J. H. Burt.

American Association for the Advancement of Science. Indianapolis, Ind. December 27, 1937-January 1, 1938. Dr. Henry B. Ward, Secretary, Smithsonian Institution Bldg., Washington, D. C.

Southern California Veterinary Medical Association. Chamber of Commerce Building, Los Angeles, Calif. December 31, 1937. Dr. B. B. Coale, Secretary, 203 Administration Bldg., Union Stock Yards, Los Angeles, Calif.

Southern California, Veterinary Hospital Association of. Los Angeles, Calif. December 31, 1937. Dr. L. B. Wolcott, Secretary, 1434 W. Slauson Ave., Los Angeles, Calif.

California State Veterinary Medical Association and University of California Veterinary Conference. University Farm, Davis, Calif. January 3-7, 1938. Dr. Chas. J. Parshall, Secretary, Brentwood, Calif.

Pennsylvania, Conference of Veterinarians at University of. School of Veterinary Medicine, 39th St. and Woodland Ave., Philadelphia, Pa. January 4-5, 1938. Dr. G. A. Dick, Dean, 39th St. and Woodland Ave., Philadelphia, Pa.

Maine Veterinary Medical Association. Wooster House, Hallowell, Me. January 5, 1938. Dr. S. W. Stiles, Secretary, Falmouth Foreside, Me.

New York City, Veterinary Medical Association of. Hotel New Yorker, 8th Ave. and 34th St., New York, N. Y. January 5, 1938. Dr. J. B. Engle, Secretary, Box 432, Summit, N. J.

Saint Louis District Veterinary Medical Association. Melbourne Hotel, Saint Louis, Mo. January 5, 1938. Dr. Milton R. Fisher, Secretary, 3678 Dover Pl., Saint Louis, Mo.

Houston Veterinary Association. Houston, Texas. January 6, 1938. Dr. Claude Canion, Secretary, 409 Link Rd., Houston, Texas.

Cornell University, Annual Conference for Veterinarians at. New York State Veterinary College, Ithaca, N. Y. January 6-7, 1938. Dr. W. A. Hagan, Dean, New York State Veterinary College, Cornell University, Ithaca, N. Y.

Intermountain Livestock Sanitary Association. Ogden, Utah. January 6-8, 1938. Dr. D. E. Madsen, Secretary, Utah Experiment Station, Logan, Utah.

Vermont Veterinary Medical Association. Montpelier Tavern, Montpelier, Vt. January 8, 1938. Dr. G. N. Welch, Secretary, 43 Union St., Northfield, Vt.

- Ak-Sar-Ben Veterinary Medical Association. Hotel Fontenelle, Omaha, Neb. January 10, 1938. Dr. W. H. Riser, Secretary, 525 17th St., Des Moines, Iowa.
- Minnesota State Veterinary Medical Society. Nicolett Hotel, Minneapolis, Minn. January 10-11, 1938. Dr. C. P. Fitch, Secretary, University Farm, Saint Paul, Minn.
- Oklahoma Veterinary Medical Association. Skirvin Hotel Oklahoma City, Okla. January 10-11, 1938. Dr. F. Y. S. Moore, Secretary, McAlester, Okla.
- Tennessee Veterinary Medical Association. Patton Hotel, Chattanooga, Tenn. January 10-11, 1938. Dr. A. C. Topmiller, Secretary, Department of Agriculture, Nashville, Tenn.
- Chicago Veterinary Medical Association. Hotel Sherman, Chicago, Ill. January 11, 1937. Dr. O. Norling-Christensen, Secretary, Box 12, Wilmette, Ill.
- Rhode Island Veterinary Medical Association. Hotel Narragansett, Providence, R. I. January 11, 1938. Dr. J. S. Barber, Secretary, 14 Washington St., Central Falls, R. I.
- Southeastern Michigan Veterinary Medical Association. Medical Arts Building, 3919 John R. St., Detroit, Mich. January 12, 1938. Dr. F. D. Egan, Secretary, 17422 Woodward Ave., Detroit, Mich.
- Williamette Valley Veterinary Medical Association. McMinnville, Ore. January 12, 1938. Dr. Elwyn W. Coon, Secretary, Forest Grove, Ore.
- New Jersey, Veterinary Medical Association of. Hotel Hildebrecht, Trenton, N. J. January 12-13, 1938. Dr. J. G. Hardenbergh, Secretary, c/o Walker-Gordon Laboratory Co., Plainsboro, N. J.
- Texas, State Veterinary Medical Association of. Houston, Texas. January 13-14, 1938. Dr. M. B. Starnes, Corresponding Secretary, Public Health Dept., Dallas, Texas.
- South Carolina Association of Veterinarians. Jefferson Hotel, Columbia, S. C. January 18, 1938. Dr. R. A. Mays, Secretary, 408-410 State Office Bldg., Columbia, S. C.
- Iowa Veterinary Medical Association. Des Moines, Iowa. January 18-20, 1938. Dr. C. J. Scott, Secretary, Knoxville, Iowa.
- Kansas Veterinary Medical Association. Jayhawk Hotel, Topeka, Kan. January 19-20, 1938. Dr. Chas. W. Bower, Secretary, 1128 Kansas Ave., Topeka, Kan.
- Ohio State Veterinary Medical Association. Neil House, Columbus, Ohio. January 20-21, 1938. Dr. R. E. Rebrassier, Secretary, Ohio State University, Columbus, Ohio.

Mississippi State Veterinary Medical Association. Jackson, Miss. January 24-25, 1938. Dr. E. H. Durr, Secretary, Clinton Blvd., Jackson, Miss.

Michigan State College Short Course for Veterinarians. Michigan State College, East Lansing, Mich. January 24-28, 1938. Dr. Ward Giltner, Dean, Michigan State College, East Lansing, Mich.

Indiana Veterinary Medical Association. Severin Hotel, Indianapolis, Ind. January 25-27, 1938. Dr. W. B. Craig, Secretary, 1420 N. Alabama St., Indianapolis, Ind.

Missouri Veterinary Medical Association. Hotel Ruff, Marshall, Mo. January 25-27, 1938. Dr. C. L. Campbell, Secretary, 1817 Holmes St., Kansas City, Mo.

Ontario Veterinary Association. Royal York Hotel, Toronto, Ont. January 27-28, 1938. Dr. W. J. Rumney, Secretary, 612 King St. W., Hamilton, Ont.

Connecticut Veterinary Medical Association. Hotel Bond, Hartford, Conn. February 2, 1938. Dr. Geo. E. Corwin, Secretary, 269 State Office Bldg., Hartford, Conn.

Hudson Valley Veterinary Medical Society. Poughkeepsie, N. Y. February 9, 1938. Dr. J. G. Wills, Secretary, Box 751, Albany, N. Y.

Illinois State Veterinary Medical Association. Hotel Abraham Lincoln, Springfield, Ill. February 17-18, 1938. Dr. C. C. Hastings, Secretary, Williamsville, Ill.

Alabama Veterinary Medical Association and Short Course for Graduate Veterinarians. College of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala. February 21-25, 1938. Dr. I. S. McAdory, Secretary, Alabama Polytechnic Institute, Auburn, Ala.

American Veterinary Medical Association. Hotel Pennsylvania, New York, July 5-9, 1938. Dr. H. Preston Hoskins, Secretary, 221 N. La Salle St., Chicago, Ill.

STATE BOARD EXAMINATIONS

Connecticut State Board of Veterinary Registration and Examination. State Office Building, Hartford, Conn. January 4, 1938. Dr. Geo. E. Corwin, Secretary, State Office Bldg., Hartford, Conn.

South Carolina State Board of Veterinary Examiners. Jefferson Hotel, Columbia, S. C. January 18, 1938, at 2:30 P. M. Dr. W. A. Barnette, Secretary, Greenwood, S. C.

SOME HERNIAS IN THE EQUINE AND BOVINE*

By E. R. FRANK, *Manhattan, Kan.*

Kansas State College

One of the most common varieties of hernias occurring in large animals is the reducible umbilical hernia in the horse. Probably in the largest percentage of cases this type of hernia is congenital. It frequently disappears spontaneously, but if this does not occur by the time the colt is nine to twelve months of age, some form of surgical interference is necessary. Figure 1 shows a typical reducible umbilical hernia in a yearling colt.

In a typical hernia the sac is composed of skin, some subcutaneous tissue and the parietal peritoneum. The peritoneum and skin are usually adherent to each other and if they are not adhered, there may be some difficulty in keeping the two together when the horse is cast for the operation. The size of the hernial opening will vary from one which will admit one finger to an opening several inches in diameter. In shape the opening is usually round, oval or slit-like. The thickness and firmness of the edges of the ring will determine the procedure in the operation. This will be discussed more in detail later in the operative procedure. The contents usually consist of a loop of small intestine or omentum, or both.

The hernia should be examined carefully to determine if the contents are reducible. There should never be any doubt in the operator's mind as to whether the hernia is reducible or not.

The use of a general anesthetic is not necessary, but in nervous individuals it is best to give enough chloral hydrate to quiet them. Also, the area in the fundus of the sac where the forceps are applied should be infiltrated with a 1 per cent solution of a local anesthetic.

The base of the sac, where the clamp is to be applied, should be shaved and then a good skin antiseptic applied to the area.

The method we prefer for the treatment of the reducible umbilical hernia is by the use of the clamp. If available, the patient can be placed on an operating-table or cast in dorsal recumbency as for castration. The clamp, which has been sterilized, should be opened just wide enough to slip over the end of the sac. A pair of tumor forceps are now applied to the fundus of the sac, making sure that the peritoneum is retained with the skin. Also, determine if the contents are free from and above

*Presented at the seventy-fourth annual meeting of the American Veterinary Medical Association, Omaha, Neb., August 16-20, 1937.

the clamp. The clamp is tightened so that it requires a little force to push it. It is desirable to have an assistant apply traction on the forceps while the operator applies a sliding and rocking motion to the clamp. By a combination of these methods, all of the sac possible is pulled through the clamp. The convex portion of the clamp is set tightly against the hernial ring. When the operator feels that the clamp is in the proper position, the screws should be tightened until the clamp is held firm. The clamp should be tightened just enough so the sac will come away

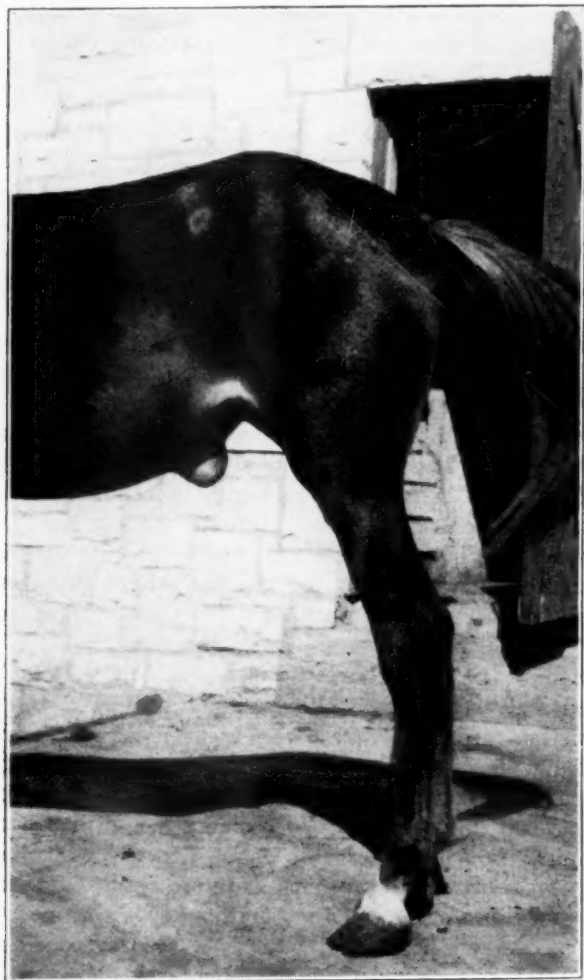


FIG. 1. Umbilical hernia in a horse.

in not less than eight to ten days. Examination of the clamp should be made frequently to see if it needs to be adjusted.

If the edges of the hernial ring are thin and not firm, it is advisable to inject an irritant into the tissues after the clamp is applied to stimulate the development of more inflammatory tissue. This consists in injecting 1 cc at points into the tissues around the ring but not through into the peritoneum. These points should be about two inches apart and a total quantity of 10 to 20 cc used. The irritant we use consists of equal parts of turpentine and chloroform.

After the horse is on his feet, the weight of the clamp should be supported by a strap adjusted to fit snugly around the body. This strap will also prevent the clamp from being lost when the clamp comes loose. It is advisable to administer a prophylactic dose of tetanus antitoxin.

VENTRAL HERNIA

Those hernias in which the contents come through an unnatural opening in the abdominal wall are called ventral hernias. In horses they usually occur from kicks, blows from blunt objects, or from overstretching of the abdominal muscles by a sudden, unexpected effort.

Figure 2 illustrates a ventral hernia in the ventral abdominal wall. In the case illustrated, the opening in the abdominal wall was eight inches in diameter.

Some of the principles employed in the surgical treatment of ventral hernias are taken from Doctor Fuller's article in the *North American Veterinarian* for March, 1935.

The patient should be starved for 36 hours to reduce the contents of the digestive tract. A trachea-tube is inserted before the operation and is kept there for seven to ten days following the operation. This is to prevent any excessive pressure on the operative area by the patient straining.

The patient was given two ounces of chloral hydrate with a stomach-tube and the subcutaneous tissue and deeper tissues were infiltrated with 125 cc of a 1½ per cent solution of procaine hydrochloride.

The patient was confined on the operating-table in lateral recumbency. The operative area had been previously shaved and painted with an alcoholic solution (1-500) of bichloride of mercury. The operation must be performed as aseptically as possible. A sterile sheet was placed over the operative area, and an opening just large enough to admit the hernial sac was made in the center of the sheet. The skin was again thoroughly cleansed with a

1-500 solution of bichloride of mercury in alcohol. A vertical incision through the skin was made over the center of the sac. By blunt dissection the skin was dissected loose from the peritoneum down to the edge of the hernial ring. This dissection was continued until the edge of the opening was exposed for two inches on the outside.

To close the opening, heavy sutures made of $1\frac{1}{2}$ -inch strips of heavy muslin are used. The sutures are so placed that when they are tightened, one edge of the ring overlaps the other about $1\frac{1}{2}$ inches. This is accomplished by passing the suture through one edge from the outside to the inside, carrying it across the ring, then passing the suture through the edge from the outside to the inside, then from the inside to the outside about $1\frac{1}{2}$ inches from where it entered, back across the ring and passed through the edge from the inside to the outside. When the suture is pulled tight, it causes the edges to overlap. Three of these sutures were placed along the edges of the ring.

The skin wound was closed with mattress sutures, drawing the skin tight enough to give some support to the operative area. A bandage was placed around the body to give support to the operative area. The muslin sutures were removed in two weeks.

For three days following the operation, more concentrated feed was fed, and the bulky feed reduced.

VENTRAL HERNIA IN A COW

Figure 3 illustrates a ventral hernia in a cow. This type of hernia usually occurs about one week or ten days before parturition. The great distention of the abdomen and tenseness of the tissues favors its occurrence if the cow is hooked in the side by another. The peritoneum was ruptured and the contents consisted of small intestine. The ring was a slit in the muscles about eight inches long. It was located about half-way up on the side. This area was shaved and thoroughly painted with a 1-500 solution of bichloride of mercury in alcohol. Anesthesia consisted in giving 40 cc of a $1\frac{1}{2}$ per cent solution of procaine hydrochloride into the epidural space.

To return the contents to the abdominal cavity, it was necessary to elevate the posterior part. This was accomplished by casting the cow and tying ropes around and above the hock-joints, and then fastening the rope to a chain hoist. It was necessary to raise the posterior parts about three feet.

A vertical incision six inches long was made through the skin. Then, by gentle manipulation with the hands, the intestines were returned to the abdominal cavity. The opening in the peritoneum

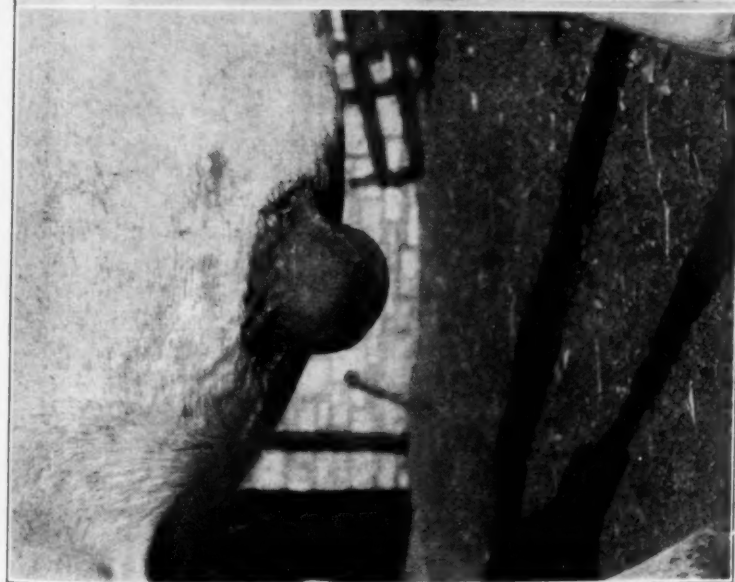


FIG. 2. Ventral hernia in a horse.



FIG. 3. Ventral hernia in a cow.

was closed with a continuous suture of No. 4 catgut. The muscle layers were closed separately with continuous sutures of No. 4 chromic catgut. The skin incision was closed with mattress sutures of umbilical tape.

It is advisable to watch these cases carefully, so that when they are calving, help can be given. If help is not given, the strain of parturition may cause the sutures to be torn out of the tissues with recurrence of the hernia.

SCROTAL HERNIA IN A BULL

In this hernia the contents of the sac were the small intestines. They were down alongside the testicle on the right side. Figure 4 is a lateral view of the hernia and figure 5 is a posterior view.

The patient was a six-year-old purebred Hereford bull weighing about 1,800 pounds. The hernia had been getting gradually larger for about a year.

It was decided to operate on the bull in the standing position. To reduce the content in the digestive tract, all food was withheld from the patient for 36 hours.

Starting just below the transverse processes of the lumbar vertebrae on the right side, an area six inches wide and ten inches long was shaved and thoroughly cleansed with carbon tetrachloride. The area was then thoroughly painted with a 1-500 solution of bichloride of mercury in alcohol.

The skin, subcutaneous tissue, muscle and peritoneum were infiltrated with 125 cc of a 1½ per cent solution of procaine hydrochloride. Also, 50 cc of a ½ per cent solution of procaine hydrochloride was injected epidurally.

A vertical incision seven inches long was made in the skin and starting it just below the transverse processes of the lumbar vertebrae. This same incision also was continued through the external oblique muscle. The internal oblique muscle was divided in the direction of its fibers, which is downward and forward. The vertical incision was made in the transverse muscle and peritoneum.

A new pair of sterile rubber gloves were put on before the hand was inserted into the peritoneal cavity. Examination of the ring revealed that the small intestine had passed through the ring, and the omentum was adherent to the anterior edge of the ring. It was necessary to have an assistant force the contents up from the outside, as it was impossible to lift them.

An attempt was made to use catgut to suture the edges of the internal ring together, but it was not strong enough to pull the



Fig. 4. Scrotal hernia in a bull (lateral view)



Fig. 5. Scrotal hernia in a bull (posterior view)

edges together. A double strand of umbilical tape threaded on a No. 3½ circle needle was used to suture with. The suturing was performed with the right hand and the left hand was used only to tie the knots. The sutures were started at the lateral commissure of the ring and a knot tied. Then a continuous suture was employed to close the ring. At the medial commissure, an opening about an inch long was left for the passage of the *ductus deferens* and the blood-vessels. The continuous suture was continued back to the original starting point at the lateral commissure and tied. As a further prevention against the recurrence of the hernia, the omentum was laid back over the sutured ring and the omentum sutured to the peritoneum with three interrupted sutures.

Adhesions take place very readily between omentum and peritoneum. The peritoneum, internal oblique and external oblique were closed separately with continuous sutures of No. 4 chromic catgut. The skin incision was closed with interrupted sutures of umbilical tape and covered with flexible collodion. The skin sutures were removed in ten days.

Some swelling of the scrotum occurred and this was treated by daily applications of hot saturated solutions of magnesium sulfate.

A report from the owner of the bull, six months after the operation was performed, stated the bull was doing fine and there was no evidence of a recurrence of the hernia.

Congress in Glasgow

Arrangements are being made to hold the 1938 Congress of the National Veterinary Medical Association of Great Britain and Ireland in Glasgow, from Monday, September 5, to Friday, September 9, inclusive.

It is believed that quite a number of veterinarians from the United States who will attend the Thirteenth International Veterinary Congress at Zurich-Interlaken, Switzerland, August 20-27, will want to avail themselves of the opportunity to attend and participate in the Congress of the National Veterinary Medical Association of Great Britain and Ireland.

Anyone who is able to include Glasgow in his itinerary will have the opportunity to visit the Empire Exhibition which will be staged in that city from May until October. This will be the greatest exhibition to be held in the British Isles since the Wembley Exhibition some years ago.

DISEASES OF FEEDER CATTLE*

By I. J. KLEAVELAND, Sioux Rapids, Iowa

Our ability to understand and cope with the feeder's problems is of paramount importance in the success of his enterprise. His confidence in us is based on results and our ability to make him money. In order that we may meet on a common plane, we must be able to talk his language. We should be good judges of quality and weight of cattle and, above all, we should have a practical knowledge of feeds and feeding.

I am not trying to set myself up as a specialist on feeds and feeding. I will leave that to Morrison and other animal husbandmen but, as long as two-thirds of our trouble in feeding cattle arises from unbalanced rations and faulty feeding, we should know something about it.

All the different classes of cattle have their feeding problems, but I believe the baby beef feeder requires the greatest skill. The fact that the calf has just been weaned, has had a long ride in a truck or on the railroad, with feed and water once in 24 or 48 hours, necessitates some careful handling to get him on feed and finished in ten months as a baby beef.

Shipping fever, to any general practitioner in the Corn Belt, is rather a time-worn subject. However, every fall and through until spring, we have to contend with it. From my observation I believe that shipping fever is a secondary invader, at least in the majority of cases. Our feeders usually buy their cattle in the fall and early winter. The yearlings and two-year-old cattle in good condition are not so much of a problem as the calves. Some of these calves are on the road five days. They have just been taken off the cows. The long ride, together with a change of feed and inclement weather, lower the vitality and predispose to colds.

Usually in from five to eight days after the calf arrives, he stands around and hangs his head, is off feed and presents the usual appearance of a calf with pneumonia. The temperature will range from 105 to 107° F. I have had occasion several times, when I was using the serum treatment and treating only the sick ones, to temperature all the calves. I have found that these calves will run a high fever three days before they become noticeably sick. Wherever it is possible, I vaccinate these calves as soon as they arrive and advise the owner in regard to the feeding and care.

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During the past few years, there have been various methods advocated for treating these calves and I guess I have tried most of them. I have found that the less you work or fight with a calf in drenching or handling him the better off he is. I always use a diphtheroid bacterin and give from 15 to 20 cc. This is repeated in four days on the sick ones. The results are gratifying and the owner is willing to pay the bill when he gets results.

When cattle are bought in the early fall, they are run on pasture and through the stock field before going into the feed-yard. It is at this time when forage poisoning is a problem. Prussic acid poisoning can readily be diagnosed from symptoms and the history of the feed consumed. When in doubt, use sodium thiosulfate or nitrite intravenously and the recovery is rapid if the cause is prussic acid. A delay in treatment may be expensive to the feeder.

Cornstalk poisoning, such as we had last fall, does not respond to treatment and cattle should be removed from such fields where the loss may be heavy.

The ordinary molds are usually not very dangerous unless taken in excessive amounts. I have seen cattle do well on moldy clover hay, while clover hay that had a lot of pig-weed in it and was moldy would kill cattle as fast as prussic acid. Corn fed on the cob to the young cattle may be poisonous where the cob is moldy. Shelling this corn will knock enough of the mold off so that it can be fed safely.

Occasionally we see a condition in feeding cattle that appears to be a mycotic or aphthous stomatitis. It starts out with small blisters on the nose, under the tongue and on the lips. Some animals will show blisters between the toes. The condition will resemble foot-and-mouth disease. The owner sells about the time the blisters have broken and the nose and mouth are red as beets. This condition is generally not of a contagious nature, as probably only two or three in the lot will show it. Palatable feed and some astringent dressing such as pyoktannin will take care of it without very much shrink.

Lameness in feed-lot cattle can cause a lot of shrink if not taken care of. Footrot is the main offender. By curetting the necrotic tissue away and using iron sulfate in a concentrated solution on a gauze pack it responds to treatment. I bandage the foot, giving good protection to the crevice between the claws and then tar the bandage. One treatment is usually enough and then the animals are turned back into the feed-lot.

Urinary calculi are not uncommon in cattle. I have operated on several cases, but the results have not been so satisfactory.

The operation is not a hard one and it looks good at the time it is done, but I could never suture the urethra close enough to prevent a seepage of urine into the surrounding tissues. The last few years, where the size of the animal permitted, I have catheterized the bladder, using a 14-gauge needle attached to a rubber tube. This method gives only temporary relief, so the animal usually is sent to market at once or slaughtered on the farm.

Inflammation of the prepuce is another condition that is not treated with much satisfaction. Irrigation and cleaning the lime deposits from the prepuce do not give relief because, where the swelling is already extensive, the steer will urinate in the sheath and cause a constant irritation. I make a five- or six-inch incision just anterior to the S-curve over the penis, drawing the penis down through this incision and then swabbing out the sheath and covering with petrolatum. In about two weeks, the swelling will leave, the steer will appear normal and should be sent to market. If kept too long or until the incision is healed, you will have the same trouble over again. These steers are usually tagged by the inspector at the market but the salvage is usually large enough to warrant trying to save it.

Bloody diarrhea is a common condition of cattle in the feed-lot. It most commonly occurs at the latter end of the feeding period and is first noticed when a little blood appears in the feces. This increases until the steer goes off feed. The condition usually follows heavy feeding on high protein feeds and not enough carbohydrates. If noticed in time, it can be stopped by cutting down on feeds high in protein and adding more hay or straw. Individual treatment with intestinal antiseptics and astringents is of value. After the animals have recovered, it is necessary to bring them back to a full feed rather slowly.

This condition is sometimes seen in cattle just started on feed and is caused by poor moldy feed or by a heavy grain ration. It is successfully handled through proper feeding.

Deficiencies in the feed do not play so big a part in feeding cattle as they do in dairy or breeding stock. About the only time they are of importance is when cattle are carried over on rough feeds and in abnormal growing seasons, in which case there is apt to be a phosphorus deficiency. Phosphorus deficiency is much more severe in calves than in yearlings or two-year-olds. I have seen calves die when they apparently had plenty to eat. The addition of steamed bone meal, bran and a little grain will straighten them out.

I always try to advise my clients about the dangers or deficiencies in the feed before their lack becomes apparent. Of course there are farmers who will not coöperate but they are being educated through their farm papers and are gradually getting the idea that there may be something lacking in their feeds.

Calcium deficiency is not so apparent. This is due to the fact that the length of the feeding period is not long and either alfalfa or clover hay is fed, which will usually supply plenty of this mineral while the grains are high in phosphorus.

Tanning an Important Industry

The tanning industry has become one of huge proportions. The annual output of leather amounts to \$300,000,000, according to *The Cattleman*. Hides, skins and tanning material are imported into the United States from more than 110 countries. The value of the imports of hides and skins in 1936 was about \$54,770,000. To this amount may be added the value of hides and skins produced in the United States, to show the importance of the industry. There are 400 tanneries in the country today, as compared to 2,400 in 1800, but more men are employed to produce leather than in the previous century. Hides constitute the most valuable by-product of meat processing.

Less Rapid Decline in Horses and Mules Predicted

The U. S. Bureau of Agricultural Economics, in its annual outlook report released last month, predicted a continued, but less rapid, decline in the number of horses and mules on farms. The Bureau stated that the long-continued downward trend will probably continue until 1940 or 1942, when it is expected that the number of colts raised will be equal to the number of older animals disappearing from farms for one reason or another.

On January 1, 1937, there were 16,130,000 horses and mules on farms, the smallest number since 1889. There was a very sharp decrease during the decade from 1920 to 1930, but during more recent years, the decrease has been more gradual.

The Bureau pointed out that "since it is probable that the need for motive power will not expand greatly, the number of horses and mules of working age now may represent the maximum number needed. Producers of horses and mules were advised to "observe closely the trends in colt production and in use of mechanical power."

ACTIVITIES OF THE BUREAU OF AGRICULTURAL ECONOMICS IN THE INSPECTION OF POULTRY AND POULTRY PRODUCTS THAT ARE OF INTEREST TO THE VETERINARY PROFESSION*

By R. B. MERICLE, Omaha, Neb.

*Bureau of Agricultural Economics
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The Bureau of Agricultural Economics conducts a grading and/or inspection service on many agricultural products, including butter, cheese, eggs, and live and dressed poultry, according to federal specifications. Most of these commodities are of little interest to the veterinarian except as a consumer. Butter and eggs are merchandised quite extensively, especially in the larger cities on a government graded basis. The Bureau also conducts a market news service on farm products which is of considerable value to producers, distributors and consumers.

Of primary interest to the veterinary profession is the inspection of drawn poultry, because this particular work is carried on only by graduate veterinarians.

The beginning of the inspection of poultry by the Bureau of Agricultural Economics dates back to 1928. Prior to that time, very little or no work had been done in the inspection of drawn poultry. That year an ordinance was passed by New York City Health Department which prohibited the sale of eviscerated poultry in that city unless it had been inspected and identified as such by an authorized agency acceptable to the Department of Health. Those affected by this regulation were the packers of canned poultry products who marketed their produce in the city of New York, for at that time no drawn poultry in either fresh or frozen form was packed commercially for sale in interstate commerce.

The packers of canned poultry products who were marketing their products in New York were, by the ordinance, barred from that market unless their product was inspected by an agency which was approved by the health authorities. They began to investigate the possibilities of federal inspection, since all meat and meat products moving interstate must be federally inspected. Much to their disappointment they learned that the Meat Inspec-

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tion Act of 1906 did not include poultry or poultry products. There was, therefore, no authority under which the Bureau of Animal Industry could do this work for the poultry canners and they then came to the Bureau of Agricultural Economics, which had authority to inspect poultry and other farm products for class, quality, grade and condition, and at that time was grading dressed poultry at a number of markets. The Bureau of Agricultural Economics was in a position to provide inspection on drawn dressed poultry and to certify it and edible products thereof for condition and wholesomeness. That was the beginning of the dressed poultry inspection service.

Other cities have passed similar ordinances prohibiting the sale of uninspected poultry products. Most canned poultry packers, in order to comply with these regulations, are now utilizing this inspection service. The products that are now inspected are identified as such by a label which bears the inspection legend of the Bureau of Agricultural Economics, which reads, "Inspected and Certified by Bureau of Agricultural Economics, U. S. Department of Agriculture."

EQUIPMENT

The equipment used in most plants where the poultry is inspected is very similar to that used in the hog products division of a large packing-house. The inspection table consists of a series of stainless steel pans connected by a chain belt which causes the whole to move in a continuous rotating circuit. After passing the length of the table, the trays pass under the table and through a chamber which washes and sterilizes the pans before they are returned for use after passing under the length of the table. The first operation at the table consists in placing one bird in each pan. Plant employes open the abdominal and thoracic cavities and draw out the internal organs for inspection. Each bird passes before the federally licensed veterinary inspector, who closely scrutinizes the entire bird and especially the liver, spleen, intestine and other organs for evidences of disease. He either accepts or rejects each bird. All rejected birds are committed into the "little red bucket" labeled "U. S. Condemned," from which they are removed later to be incinerated or denatured in such a manner so as to make them unfit for human consumption.

The "accepted" birds pass from the inspector's table to the next step, where the head and feet are removed, and in this form they pass on to the eviscerating table. Here all internal organs, including the lungs and kidneys, are removed, and the heart, liver and gizzard separated from the remaining viscera,

which become inedible refuse. The eviscerating table is similar to the inspection table in that it is made of stainless steel and is provided with running water to insure removal of all filth and proper sanitation. In the next operation, both birds and giblets are thoroughly washed preparatory to being processed or packaged for sale.

Recently several firms have made definite progress in the marketing of full-dressed, government-inspected, "ready to cook" poultry. The birds are packaged in two ways. Either the entire full-drawn bird is wrapped in cellophane, or the carcass is disjointed and the parts packed separately or together. This poultry is ready to be cooked for in the plant, under government inspection, each bird has been thoroughly washed and prepared and it is ready for the roaster or the frying pan or broiler when taken from the package.

STATISTICS

In 1935, 23,268,441 pounds of dressed poultry were government inspected and of this amount over half a million pounds were condemned as unfit for human food. During the following year, 1936, over 33,000,000 pounds were government inspected, of which nearly 700,000 pounds were condemned. This is an increase of 43 per cent in the total amount of poultry that was government inspected. The condemned birds were rejected because of diseased conditions, the most common cause of condemnation being tuberculosis. Other conditions and diseases that are encountered in poultry offered for inspection at canning plants are septicemia, emaciation, decomposition, peritonitis, tumors, leukemia and abscesses.

The birds that are packaged as whole birds or as parts of birds are quickly frozen and kept in this condition until they reach the ultimate consumer. There has existed a slight prejudice, on the part of consumers, against frozen foods of every kind but as the consuming public is becoming more and more educated to the fact that the freezing of foods does not have a detrimental effect on the quality or purity of them, they are learning that this is especially true of products which are seasonal and must be protected by refrigeration in order to be carried from the season of flush production to other out-of-season periods. Fresh poultry is a seasonal product. In order to meet the demands for these classes of poultry at all seasons of the year, supplies must be stored and frozen, either in eviscerated or uneviscerated form. Up to this time there has been very little eviscerated poultry carried in storage. The common practice has been to freeze the uneviscerated birds in wooden

boxes. The broiler season is in the spring and early summer. The roaster and turkey season is in the fall. Young ducklings also are seasonal.

POULTRY DEFROSTED BEFORE BEING SOLD

If the birds are to be kept in a frozen state until they reach the terminal markets, the transportation systems must employ proper methods of refrigeration. It is a customary practice in retail stores to defrost all frozen poultry completely before it is offered for sale. This is done to give the bird more of a freshly killed appearance and make it easy for the butcher to draw the entrails from the bird for the consumer.

In many instances, the birds are held for several days in a defrosted condition before they are sold by the retailer. During this time decomposition due to bacterial and chemical action takes place. Gases from the intestinal content are formed which permeate through the flesh. It is small wonder that such poultry should have a "barnyard" or entrail-taint flavor, to say nothing of the possibility of it being diseased, for it is not inspected.

Practically all poultry used in urban homes today is eviscerated by the "neighborhood" butcher. The retail store employes are not educated or trained to detect the lesions of disease in poultry and therefore cannot pass on its fitness for food. In the majority of retail shops the evisceration is done on the "old chopping block," which, after years of use, becomes infested and contaminated from intestinal excreta and other body fluids from the birds.

Recently I was called in to examine three birds which had been purchased over the retail counters of three of the largest markets in one of our midwestern towns. All three birds had been drawn by the local butcher in charge. The first bird examined contained all or parts of kidneys, lungs, crop, esophagus, trachea, some feed from the crop, and the entire oil-bag. The second bird was fairly clean except for some crop feed, parts of the esophagus, trachea, and kidneys still intact. The third bird was very poorly drawn; the kidneys, lungs, heart, and pericardial sac were untouched, the esophagus, proventriculus, spleen and ovaries undisturbed. The housewife had to complete the evisceration and wash and clean the carcass—not a very tasteful task and quite unnecessary if the poultry had been full-drawn under government inspection.

COST OF INSPECTION

To the great majority, poultry is still a delicacy; and to many "chicken" is a luxury. The question often arises: "If poultry were to be handled in a manner similar to other meat food

products that require federal or city inspection, how would this affect the cost to the consumer?" Data obtained at plants having federal inspection indicated that the price per pound would be increased but the unit price per bird need be increased but little, if any. The reason is that the consumer will not be paying for a lot of inedible parts such as viscera, head and feet, which parts comprise approximately 25 per cent of the undrawn bird and depend somewhat on the size and condition of the bird. Considerable saving in freezing and storing full-drawn birds in public cold storage, where the charge is based on a weight basis, is effected. Transportation also is less because freight costs are not paid on the entrails, head, feet, and other parts of the carcass that have been removed.

The day of government-inspected, full-drawn, ready-to-cook poultry is at hand and the consuming public must be educated to the advantages of purchasing poultry in this form. By buying such poultry the housewife would eliminate all the "kitchen mess" of preparing poultry for the table and would be assured of a healthy and palatable product. All labor that is required of the butcher and housewife when ordinarily poultry is sold has been done if they buy Government-inspected, full-drawn poultry.

The future for government-inspected poultry in the United States would seem to indicate that it is here to stay and the demand for it will steadily increase.

Because of the importance of poultry inspection to the public and especially to the poultry industry, this Association, which represents the veterinary profession, should consider the assistance it could give in promoting government inspection and in educating the public to the advantages and merits of buying inspected poultry. There is operating within the city of Omaha a federally inspected poultry plant. I am authorized by this plant to extend to you an invitation to visit it while you are here. I am supervisor of the poultry inspection work in it and hope to have the opportunity of showing you the entire operation of dressing, inspecting, drawing, packaging, and freezing full-drawn, ready-to-cook poultry.

DISCUSSION

DR. A. E. CAMERON: I would like to ask the speaker at what temperature the poultry is frozen.

DR. MERICLE: Ten degrees below zero.

DR. CAMERON: And at what temperature is it maintained?

DR. MERICLE: About five below zero.

DR. E. W. BURKE: Is there any antemortem inspection?

DR. MERICLE: No.

HEMOLYTIC STREPTOCOCCI IN CHRONIC PERITONITIS AND SALPINGITIS OF HENS*

By P. R. EDWARDS and F. E. HULL
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Reports of streptococcic infections of chickens are by no means uncommon. These infections usually have taken the form of apoplectiform septicemia, in which the affected birds die very suddenly, or a sleeping sickness, in which the disease assumes a chronic form and the birds survive for a week or more after the appearance of symptoms. In the latter condition the fowls are usually described as being dull and listless, sleeping much of the time but eating well during the course of the disease. The carcasses appear well nourished at death.

Acute streptococcic septicemia of fowls has been observed by Norgaard and Mohler,¹ Bergman,² Greve,³ Magnusson,⁴ and Hudson.⁵ Chronic streptococcic infection or sleeping sickness was described by Dammann and Manegold.⁶ In all these reports the pathological changes observed were quite similar. Discoloration of the skin and subcutaneous tissue, petechial hemorrhages in the serous membranes of the pleural and peritoneal cavities, a fibro-purulent exudate on the serosa of the intestine and a small amount of sanguineous fluid in the peritoneal cavity were reported by most observers. In addition small necrotic foci in the liver and enlargement of the spleen have often been observed.

All the aforementioned writers reported a streptococcus as the causative agent of the disease but their descriptions of the organisms differ in minor particulars. Dammann and Manegold, Bergman and Greve reported that the organism in question produced capsules, while Norgaard and Mohler, Magnusson and Hudson either failed to note capsules or stated definitely that capsules were not formed. Bergmann alone characterized the streptococcus as a Gram-negative microorganism. Only Magnusson and Hudson carried out an extensive study of the fermentative properties of the streptococci. Their reports are contradictory, since Magnusson observed that acid was produced from mannitol, dulcitol and sorbitol, while Hudson stated that these substances were not fermented. It is noteworthy that Edwards,⁷ working with the streptococcus of Hudson, reported that capsules were produced and sorbitol was fermented. Only Hudson and

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Magnusson studied the effect of the streptococci on blood-agar and both found the organisms actively hemolytic.

The pathogenicity of the streptococci from hens for different animal species has been studied extensively. Dammann and Manegold, Norgaard and Mohler, Magnusson and Bergman all found that the organisms were pathogenic for mice and rabbits and that guinea pigs were refractory. In addition Bergman, Magnusson and Norgaard and Mohler reported that pigeons succumbed after being injected with organisms. Dammann and Manegold reported that sheep were susceptible while Norgaard and Mohler failed to infect this species. Norgaard and Mohler succeeded in infecting ducks with the streptococci, while Dammann and Manegold failed. Dogs were found to be resistant to the infection by Dammann and Manegold, while Norgaard and Mohler and Magnusson observed arthritis in dogs following intravenous injection of the streptococci.

The only report concerning chronic streptococcic peritonitis of hens is that of Kernkamp.⁸ This writer reported a chronic streptococcic disease of hens of which the most prominent pathological change was a chronic peritonitis accompanied by large amounts of fibrinous exudate in the peritoneal cavity. From this disease he isolated hemolytic streptococci which fermented lactose, sucrose and salicin but which failed to produce acid from inulin, mannite or raffinose. Kernkamp states that in the disease which he studied no pathological changes were observed in the ovaries or oviducts of the affected birds.

In January, 1936, two live hens were received at the laboratory for diagnosis. It was stated that losses had occurred in the flock for some time. The affected birds lost weight, became pale and emaciated and finally died. The appetite remained normal during the illness and the birds were quite alert until shortly before death. No drowsiness or droopiness was noted, the only apparent symptom of the disease being loss of weight.

On postmortem examination both birds were found to be affected with chronic peritonitis accompanied by a large amount of fibrinous exudate in the peritoneal cavity. The oviducts of both hens were enlarged and filled with concretions and purulent exudate. The concretions varied in size from 1 to 4 cm in diameter and closely resembled those found in chronic *Salmonella pullorum* infection. Material taken from the internal organs, the peritoneal exudate and concretions in the oviduct yielded pure cultures of hemolytic streptococci.

Four other hens from the same flock were examined. All were affected with chronic exudative peritonitis and salpingitis accom-

panied by concretions within the oviduct. In addition four of the six birds examined exhibited degenerative changes of the liver, and in one hen the liver was sprinkled with pin-point necrotic areas. In three birds the ova were distorted and discolored and in three there were inflammatory changes involving the pericardium and epicardium and an increased amount of pericardial fluid. In one bird all the air-sacs were inflamed and contained organized exudate.

CHARACTERISTICS OF THE STREPTOCOCCI

From all birds examined pure cultures of streptococci were isolated. *S. pullorum* was not found in the ovaries or oviducts of any of the hens. The streptococci were very actively hemolytic, producing large, clear zones of hemolysis in horse-blood-agar plates. The colonies on blood plates were moist, rather mucoid and tended to the production of a confluent growth. Microscopic examination revealed that the cocci occurred in short chains and produced prominent capsules. In glucose infusion broth the organisms reached a final hydrogen-ion concentration of pH 4.8 to 5.0. Sodium hippurate was not hydrolyzed.

The organisms produced acid from lactose, sucrose, salicin and sorbitol. Trehalose, mannitol, dulcitol and inulin were not attacked. The organisms possessed the characteristics of the *Streptococcus pyogenes* group and their fermentative properties placed them in the group referred to by Edwards⁹ as type A animal streptococci. Precipitin tests performed by the method of Lancefield¹⁰ placed the organisms in Lancefield's group C. These results are in accord with those of Edwards,⁷ who reported streptococci with identical morphological, biochemical and serological properties from apoplectiform septicemia and slipped tendon in chickens.

It is noteworthy that hemolytic streptococci having these characters are found in a wide variety of clinical conditions in many different animal species. Organisms of this type have been reported in horses, cows, sheep, foxes, hogs, rabbits, guinea pigs and mice. The present state of our knowledge regarding group C hemolytic streptococci furnishes no basis for the differentiation of cultures isolated from different animal species.

INFECTION EXPERIMENTS

Since all the birds examined had marked salpingitis, it was thought the infection might be contracted through the genital tract, the male birds acting as passive carriers of the infection. The cloacae of three normal hens were swabbed with exudate from the oviduct from a naturally infected hen. These birds

remained well during a 60-day period of observation and were apparently normal on postmortem examination. No hemolytic streptococci were found in the oviducts.

Two birds were inoculated intravenously with 24-hour broth cultures of the streptococci. One received 1.0 cc and the other 0.1 cc of the culture. The hen receiving the larger amount was visibly ill the following day, rapidly became more depressed and died the morning of the third day following injection. On post-mortem examination a slight peritonitis was observed. There were small hemorrhagic areas on the skin. Streptococci were recovered from the internal organs. The hen that received 0.1 cc intravenously also was ill on the morning following injection and died 72 hours after exposure. There were several hemorrhagic areas on the skin, a slight peritonitis was observed and the bird was affected with an ovarian tumor. Streptococci were isolated from the internal organs and from the tumor.

Two birds were injected intraperitoneally, one receiving 1.0 cc and the other 0.1 cc of broth culture. The former was ill on the morning following injection and died eight days after exposure. On postmortem examination this bird was found to have purulent arthritis involving the hip-joints. The joint cavities were filled with pus and the articular cartilages were eroded. The bird was affected with purulent pericarditis and a slight amount of exudate was present in the peritoneal cavity. Streptococci were recovered from the hip-joints and internal organs. The bird which received 0.1 cc of culture remained normal.

Two birds inoculated intramuscularly with 1.0 cc and 0.1 cc respectively of broth culture remained normal. Two birds were inoculated intranasally each with 1.0 cc of broth culture. One of these remained normal. The second hen was first observed to be depressed and reluctant to move 12 days following inoculation. Death occurred 16 days following inoculation. This bird also was affected with arthritis involving the hip-joints. The joint cavities were dry and the articular cartilages eroded. The turbinate bones were degenerated, the mucosa destroyed and the nasal cavity filled with pus. Streptococci were recovered from the hip-joints, the turbinates and the internal organs.

The birds which remained unaffected by the injections were killed after 60 days and subjected to bacteriological examination. No streptococci were found in these birds. Hemolytic streptococci were isolated from the nasal exudate of one hen which was not inoculated but which had been housed with the inoculated birds. Whether the organisms were contracted from the inoculated hens or whether their presence was due to a preëxisting

infection cannot be said. The presence of streptococci in this bird confirms the observation of Hudson,⁵ that healthy fowls may act as carriers.

It will be noted that no extensive peritonitis resulted from the inoculations. In this our results differ from those of Kernkamp,⁸ who produced exudative peritonitis in some of the chickens which he inoculated intraperitoneally and intravenously. Our failure to produce a marked peritonitis in the inoculated birds may be explained by two facts: First, the number of experiment animals examined here was so small that no conclusions should be drawn from them. Second, the chickens which received comparable amounts of our cultures died much more quickly than did the birds with which Kernkamp worked. It is possible that the longer periods elapsing between inoculation and death resulted in the production of exudative peritonitis.

The method of transmission of this infection is not clear. The pathological changes observed seemed to indicate that the genital tract might be the portal of entry. It is notable that Kernkamp⁸ was able to produce streptococcic peritonitis in one hen by introducing 5 cc of broth culture into the cloaca. Our experiments, in which such a massive dose was not used, were negative. Hudson⁵ states rather emphatically that the portal of entry in apoplectic form septicemia is the respiratory tract. While the pathological changes observed do not support the view, the respiratory tract may be the portal of entrance in the cases recorded here and the difference in the clinical and pathological features of the two diseases may be due simply to the interaction between the parasite and the host.

SUMMARY

A chronic infection of hens due to hemolytic streptococci was observed. The only constant pathological changes noted on post-mortem examination were exudative peritonitis and salpingitis accompanied by the presence of concretions in the oviduct. The streptococci, which were sorbitol-fermenting strains of Lancefield's group C, were capable of producing death in hens when injected intravenously or intraperitoneally or when instilled into the nasal passages.

REFERENCES

- ¹Norgaard, V. A. and Mohler, J. R.: U. S. Dept. of Agr., B. A. I. Bul. 36 (1910).
- ²Bergman, A. M.: (1907) Cited by Magnusson.⁴
- ³Greve, L.: Deut. Tierärztl. Wchnschr., xv (1908), p. 213.
- ⁴Magnusson, H.: Cent. f. Bakt., Abt. I. Orig. lvi (1910), p. 411.
- ⁵Hudson, C. B.: Jour. A. V. M. A., lxxxii (1933), n. s. 35 (2), p. 218.
- ⁶Demmann, C., and Manegold, O.: Deut. Tierärztl. Wchnschr., xiii (1905), p. 577.
- ⁷Edwards, P. R.: Jour. Comp. Path. & Therap., xlvii (1934), p. 152.
- ⁸Kernkamp, H. C. H.: Jour. A. V. M. A., lxx (1927), n. s. 23 (5), p. 585.
- ⁹Edwards, P. R.: Jour. Bact., xxv (1933), p. 527.
- ¹⁰Lancefield, R. C.: Jour. Exp. Med., lvii (1933), p. 571.

OBSERVATIONS ON CANINE SPIROCHETOSIS IN CONNECTICUT*

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In a preliminary note, Davis, Winn and Jungherr¹ reported an outbreak of infectious jaundice in a Pointer kennel located on Long Island Sound near Stamford. The losses amounted to 41 out of 42 animals under one year of age, while seven mature dogs remained unaffected. The field disease was characterized by a rapid course and by a yellowish to orange discoloration of the abdomen, fever, dyspnea, bloody diarrhea and convulsions. Autopsy revealed pneumonic involvement of the lungs and severe congestion of the parenchymatous organs. Since this appears to be the first report of the canine disease in this country, a more detailed account of the laboratory observations seem advisable. Data are included also on a kennel epizootic of diarrhea in which intestinal spirochetes seemed to be of etiologic significance.

LITERATURE

According to Bergey,² the important human and animal pathogens of the family *Spirochaetaceae* fall into the genera *Leptospira* and *Treponema*, with *L. icterohemorrhagiae*, the cause of infectious jaundice or Weil's disease in man, and *T. pallidum*, the cause of syphilis, as the respective type species.

Canine leptospirosis: Soon after the discovery of the causative organism of infectious jaundice in man by the Japanese workers Inada and Ido,³ Krumbein and Frieling⁴ observed the infection in two German dogs living in association with Weil's disease patients. A more extensive account of the canine disease was given by Courmont and Durand⁵ in France; in England, Okell, Dalling and Pugh⁶ reported enzootic outbreaks of the disease in young dogs, and described a hyperacute hemorrhagic and subacute icteric syndrome. The disease has been observed also by Klarenbeek⁷ in Holland, by Huguenin and Bourgeois⁸ in Switzerland, and in Austria and Turkey, according to Verge.⁹

That the disease may affect other animals is evidenced by the reports of leptospirosis in foxes by Dunkin and Laidlaw,¹⁰ Macrae¹¹ and Catachpole,¹² and in wolves by Wirth, as quoted by Verge.⁹ Horses,¹³ sheep, goats and swine¹³ seem to be somewhat susceptible to experimental infection.

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Canine typhus: The disease, also known as Stuttgart disease or hemorrhagic enteritis, occurs primarily in dogs over three years old and is essentially a uremic disturbance (see Schick¹⁵), accompanied at times by multiple renal calcifications.¹⁶ Lucet¹⁷ was among the first to find spirochetes in the kidneys of affected dogs, and Lukes offered considerable evidence for regarding the organism, later described by him¹⁸ under the name of *Spirochaeta melaenogenes canis*, as the etiological agent. This opinion was upheld by Krivacek¹⁹ and Wirth²⁰ on morphologic grounds, and by Schlossberger and Pohmann²¹ by serological studies. Morphologically, the organism belongs to the genus *Leptospira* and appears to be closely related to *L. canicola*, which was recently differentiated by Schueffner²² from the cosmopolitan species, *L. icterohemorrhagiae* on the basis of serological tests and pathogenicity for guinea pigs. According to Topley and Wilson,²³ it is the common cause of Stuttgart disease; the organism has been found in canine carriers (Kouwenaar and Wolff,²⁴ and may be responsible for human infections.²⁵

Rat carriers: Numerous surveys have shown that sewer rats (*Rattus norvegicus*) and occasionally black rats (*Rattus rattus*²²) are natural immune carriers of leptospira infection, the percentage of which may vary from 10 to 40 in different localities. In North America, it was observed by Noguchi²⁶ in New York, and in other eastern key cities, according to Hull,²⁷ by Cameron and Irwin²⁸ in Toronto, Ridlon²⁹ in San Francisco, and occasionally by Gardner³⁰ in Montreal and Quebec.

Intestinal treponemiasis: Comparatively little mention has been made in the literature on treponema infection of the canine intestine. According to Nishiyama,³¹ Lucet, in 1909, observed a hemorrhagic enteritis in dogs associated with intestinal spirochetes; his own studies seemed to indicate that *Spirochaeta eurygyrata* (Werner³²) is the prevailing form in animals, that it is more frequent in individuals suffering from intestinal disturbances than in normal ones, and that it can be treated by the oral administration of a 1:300 arsaminol solution in saline solution on an empty stomach.

OBSERVATIONS ON LEPTOSPIROSIS

The specimens received from the outbreak of canine infectious jaundice¹ consisted of formalin-fixed tissue blocks of liver, lung and kidney from a field case and from two young Pointers. Histologic sections were stained with eosin-methylene blue, according to the technic of Stafford,³³ and with silver nitrate, according to Levaditi's method cited by Wenyon.³⁴ Cultural examina-

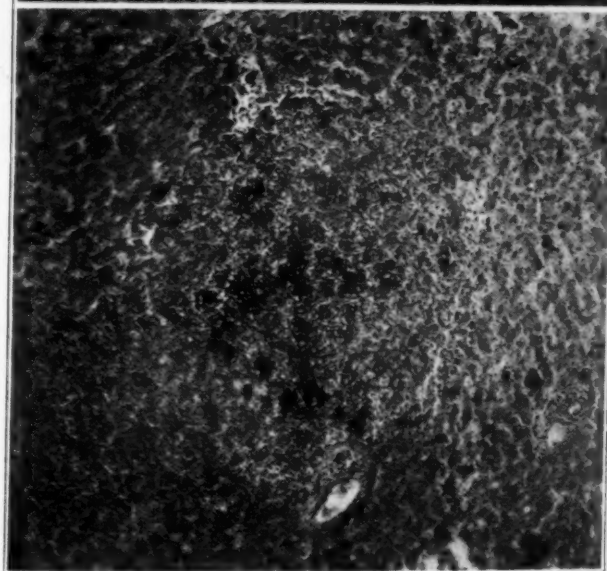
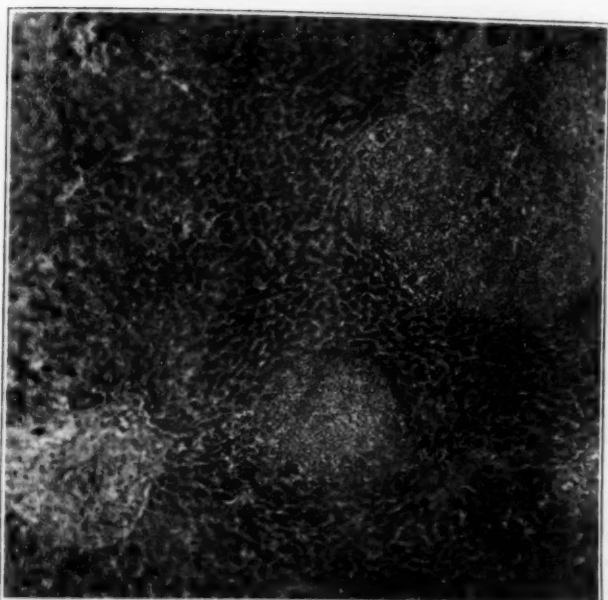


Fig. 1 (above). Liver showing focal necrosis. The black structures are clumps of leptospira. (Stained according to Levaditi's method. x 70).

Fig. 2 (below). Same tissue as figure 1, showing a necrotic focus in the center. Note absence of cellular reaction. (Eosin-methylene blue. x 70).

tion was attempted by the use of the Noguchi-Wenyon²² and the Boek and Drbohlav²³ media, and the organism observed in the dark-field and in Giemsa-stained preparations.

Fixed tissues: Under the low power, the liver showed extensive focal necrosis which seemed to originate from the periportal areas (fig. 1). Eosin-methylene blue sections observed under the high power revealed the necrotic foci as consisting of collapsed liver cells, reticular fibrils and hemorrhagic extravasations (fig. 2), but they failed to show cellular reactions or spirochetes. Silver impregnation brought out some compact argentophile clumps resembling conglomerated organisms in the normal parenchyma and numerous leptospira-like forms in the marginal zones and center of the foci (fig. 3); in these areas the organisms showed the characteristic hooked-end or question-mark appearance of leptospira, but the helicoid nature was obscured by the deeply staining periplastic envelope (Noguchi²⁵).

Lung sections showed extensive congestion of the capillaries and moderate infiltration of the alveolar and bronchial areas with serum, polymorphs and desquamated epithelial cells; these changes defined the lesions as those of bronchopneumonia. The infiltrated portions exhibited numerous granular and bacillary argentophile bodies (fig. 4), but the nearly normal regions showed the familiar serpentine form (fig. 5). A similar pleomorphism of the organism could be observed in the kidneys, where large numbers were present without having led to any major nephritic changes except hemorrhagic foci.

Live subject 1: On clinical examination the dog showed depression, decreased elasticity of the skin, bilateral mucopurulent conjunctivitis and subnormal body temperature. Putrid odor from the mouth and labored painful breathing were marked. The animal was sacrificed for examination, by chloroforming. At autopsy, fairly well developed fat deposits in the abdomen suggested the disease to be of short duration. Aside from congestion, the parenchymatous organs were macroscopically normal. The anterior portions of both lungs showed pneumonic involvement, but, on the whole, the extent of the lesions was incommensurate with the severity of the symptoms.

Microscopic examination of the blood indicated a relative polymorphonuclear leukocytosis, with a definite shift to the left. Chemical tests for albumen in the urine were negative; the sediment contained many crystals of uric acid and oxalate of lime and, in addition, tubular and pelvic elements from the kidneys. Although dark-field preparations from the sediment failed in the

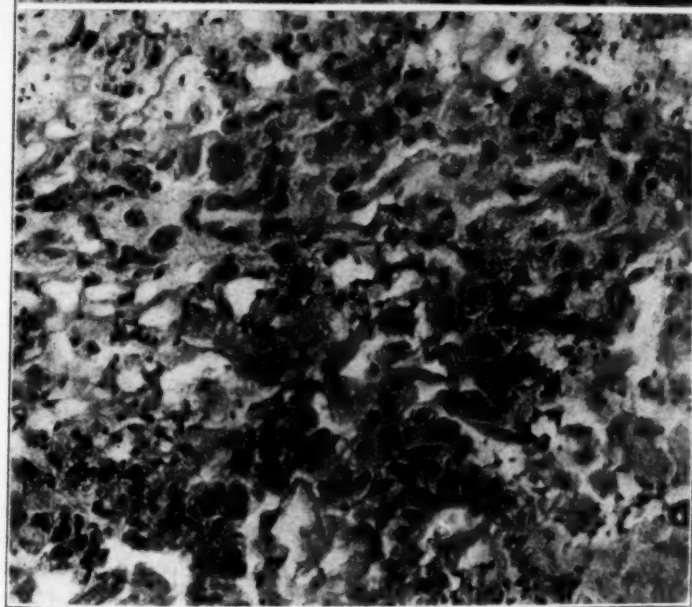


Fig. 3 (above). High power of figure 1. Margin of focus showing many leptospira with overstained perioplasts. (Levaditi. x 400).

Fig. 4 (below). Pneumonic area of lung showing degenerated forms of leptospira. (Levaditi. x 400).

attempted demonstration of spirochetal organisms, numerous leptospira were found in stained sections of lung, liver and kidneys. As the dog had been killed for examination, the possibility of postmortal invasion could be ruled out. While similar in general morphology, the organism showed less tendency toward periplastic overstaining and, in single individuals, the helicoid structure (fig. 6) or the double-hook formation (fig. 7) was apparent.

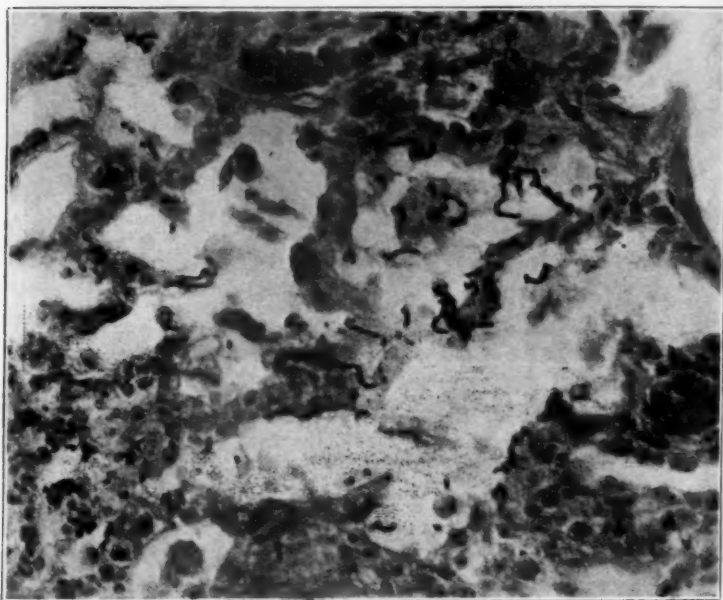


Fig. 5. Same slide as figure 4. Nearly normal lung tissue, showing characteristic serpentine forms of leptospira. (Levaditi. x 400).

Examination of the brain in eight different tissue blocks showed only one small group of leptospira in a perivascular position; minor regressive changes were found in some of the large ganglion cells, but nothing to indicate an encephalitis.

Intraperitoneal inoculation of guinea pigs with fresh blood and urine was apparently not harmful. Primary cultures of a highly motile, leptospira-like organism were obtained from the lung, liver and kidneys on both types of media used. Further inoculation of a 72-hour liver culture into two guinea pigs resulted in the death of both test animals; one pig died within three days and exhibited gelatino-fibrinous exudate on the liver capsule and congestion of the lungs. A search for leptospira by

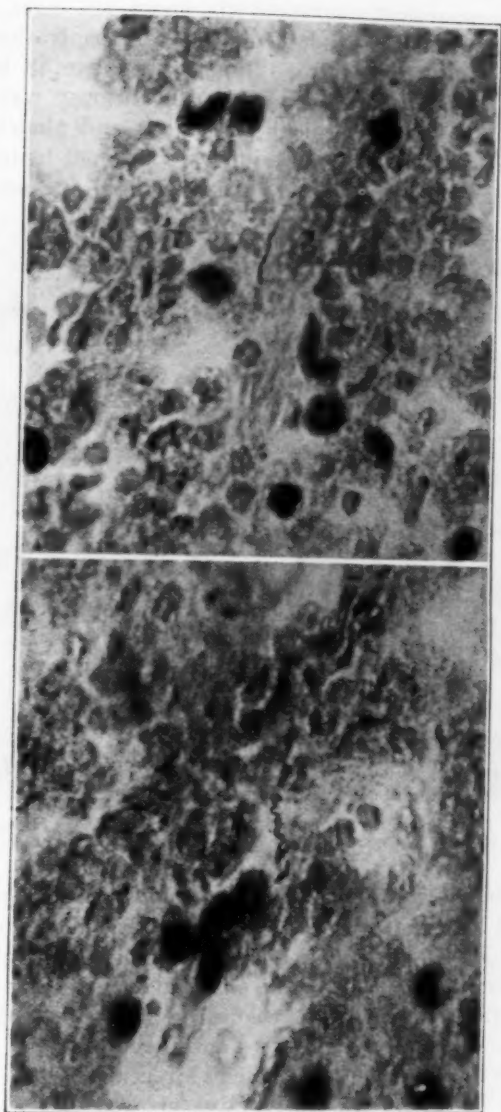


Fig. 6 (above). Kidney of live subject, showing a hemorrhagic focus with a few polymorphs; in the center a helicoid form of leptospira. (Levaditi, x 900).

Fig. 7 (below). Same as figure 6. In the center a leptospira with hooked ends. (Levaditi, x 900).

cultural and histologic means was inconclusive. The other pig showed a seropurulent conjunctivitis about six days after injection, and peritoneal exudate obtained by aspiration at that time showed many leptospira. During the next 48 hours, the animal became progressively worse and at autopsy was found to be affected with fibrinopurulent peritonitis and pleuritis. Primary cultures of the liver and kidneys contained leptospiral organisms which could likewise be demonstrated in sections (fig.

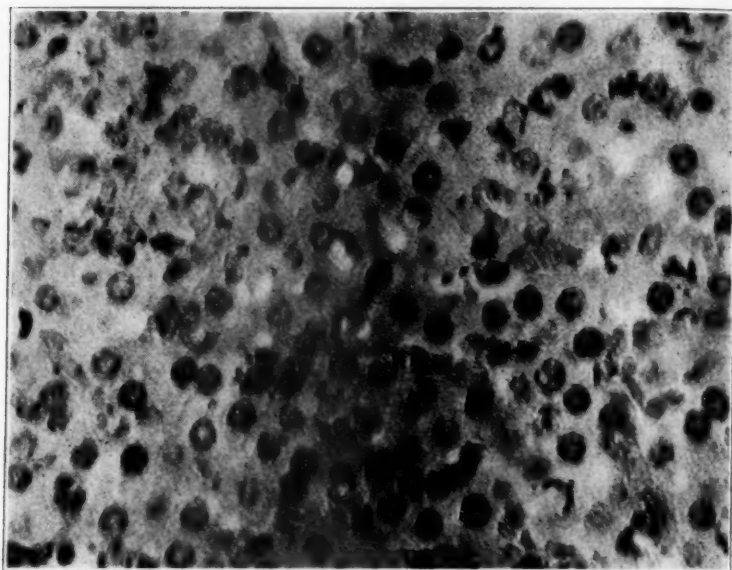


Fig. 8. Liver of guinea pig injected with a primary culture from a dog. Note leptospira-like argyrophilic bodies. (Levaditi, x 400).

8). In this and in other trials, no conclusive evidence was obtained that the organism was maintained in subcultures.

Live subject 2: This dog appeared to be fairly alert at the time of admission. During an observation period of 48 hours before it was sacrificed, it developed symptoms of dyspnea and marked nervous disturbance by continuous circular wandering in the cage and howling at frequent intervals. The carcass was in fairly good flesh; the conjunctiva showed ramiform congestion without icteric discoloration. As would be expected from the behavior of the animal, the body surface exhibited numerous traumatic abrasions; in addition, the medial aspects of the thigh were affected by elevated and, at times, ulcerated, moist, alopecic areas. Almost the entire lung showed pneumonic involvement; the liver and kidney lesions were limited to small hemorrhagic

foci in the hepatic surface, and "milk spots" in the renal capsule; the capsule proved to be difficult to detach. When the cranial cavity was opened, the meningeal vessels appeared severely congested. Unlike the preceding case, the dog showed a moderate infestation with *Toxocara canis* and *Trichuris vulpis*, and significant coccidial infection with organisms resembling *Isospora bigemina* and *I. felis*. The existence of coccidiosis in the kennel had been observed by others and was, for a time, suspected as being the real cause of the trouble.

Histologic sections of the lung were characterized by bronchopneumonic changes; the liver and kidneys revealed multiple microscopic hemorrhages, and the splenic pulp erythrophagia. *Leptospira* were fairly numerous in silver-impregnated slides of lung, liver, kidneys and the ulcerated dermal lesions, while the examination of the brain was inconclusive.

Primary cultures of leptospira were obtained from the parenchymatous organs; those from the lung and spleen on semisolid blood-agar²² showed fluffy, translucent, hemolytic colonies which revealed a petal-like structure under a hand lens and consisted of leptospira, on dark-field examination. Inability to maintain the organism in subcultures made serologic typing impossible.

OBSERVATIONS ON TREPONEMIASIS

Although the etiologic relationship of treponema to the outbreak in question is not conclusive, the case is reported for the purpose of directing attention toward intestinal spirochetes as possible causes of kennel epizootics.

A specimen of a dead dog was referred to the laboratory through the courtesy of Dr. G. E. Outwater, Norwich, Connecticut; he stated that it came from a Greyhound kennel in which 15 dogs, nine to twelve months old, had suffered from profuse diarrhea accompanied by anorexia and occasional fever; four of the animals had succumbed to the disorder. No definite clue as to the nature of the trouble had been obtained from fecal or hematologic examination, although a polymorphonuclear leukocytosis suggested an infectious origin of the disorder.

At autopsy, the dog appeared emaciated and the liver normal, except for small hemorrhagic infarcts on the diaphragmatic surface; the greater part of the left lung showed pneumonic involvement, the cut surface disclosing a purulent exudate in the bronchial rings. Lesions of the digestive tract consisted of small hemorrhagic effusions in the gastric mucosa, and edemato-mucoid swelling in the colon, associated with numerous fine petechiae and injection of the blood-vessels. Both small and large intes-

tines contained a light brown liquid material. No evidence of parasitic infestation was obtained, but direct smears of the intestinal mucosa, especially in the colonic region, swarmed with corkscrew-like spirochetes.

Cultural studies of the specimen resulted in the isolation of a beta hemolytic streptococcus from the affected lung, which was considered responsible for the pneumonic alterations. Positive cultures for spirochetes were obtained only from the intestine; they could be maintained in subcultures for several passages. Though guinea pigs inoculated with these cultures succumbed, a corresponding organism was not demonstrated, either by cultural or histologic means, in the tissues of the test animals.

While histologic sections of the other organs did not add anything significant to the gross findings, eosin-methylene blue preparations of the colon showed extensive muco-desquamative enteritis (fig. 9), and practically all of the Lieberkuhn glands in this area, and occasionally the interglandular tissue, contained from two to ten spirochetal organisms (fig. 10).

A study of individual organisms in dark-field and Giemsa preparations revealed from two to six complete turns, a thickness of about $0.4\ \mu$ and an average spiral depth and amplitude of $0.75\ \mu$ and $1.25\ \mu$, respectively. These morphologic features correspond quite closely to *Treponema eurygyrata*.^{30, 31}

SUMMARY

The laboratory findings in an outbreak of infectious jaundice in a Pointer kennel, in which 41 out of 42 young dogs succumbed, are described. According to the available evidence, this is the first reported case of this canine disease in the United States.

The pathologic features were characterized by bronchopneumonia and multiple hemorrhagic foci in the liver and kidneys; jaundice was not observed in the specimens received at the laboratory. A leptospira-like organism was found in tissues from a field case, and also in two affected dogs that were sacrificed for examination; it was demonstrated in sections of the lung, liver and kidneys, and obtained from them in primary cultures which proved to be pathogenic when injected into guinea pigs; the organism failed to grow when subcultured.

The epizootological data indicated an infection with *L. icterohemorrhagiae*, although the comparatively low virulence for guinea pigs pointed to *L. canicola*. The question of the prevailing serologic type in this territory needs further study and may be of importance in attempted specific vaccination.

In an outbreak of epizootic diarrhea in a Greyhound kennel, four out of 15 young dogs succumbed. The actual mortality

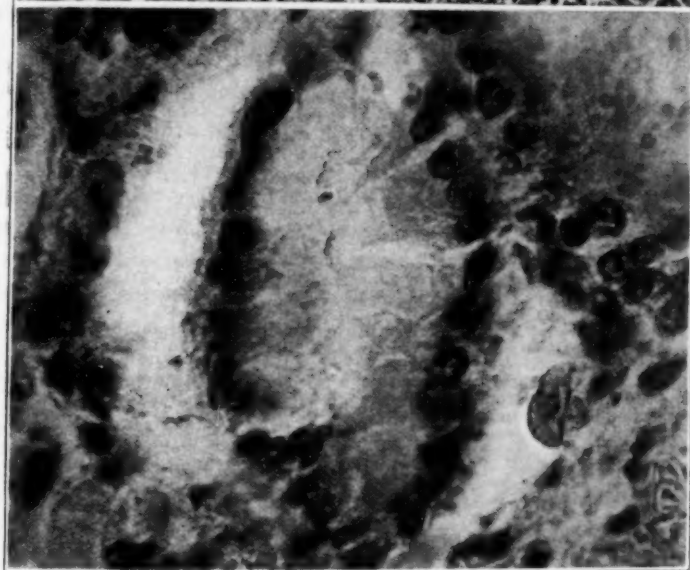
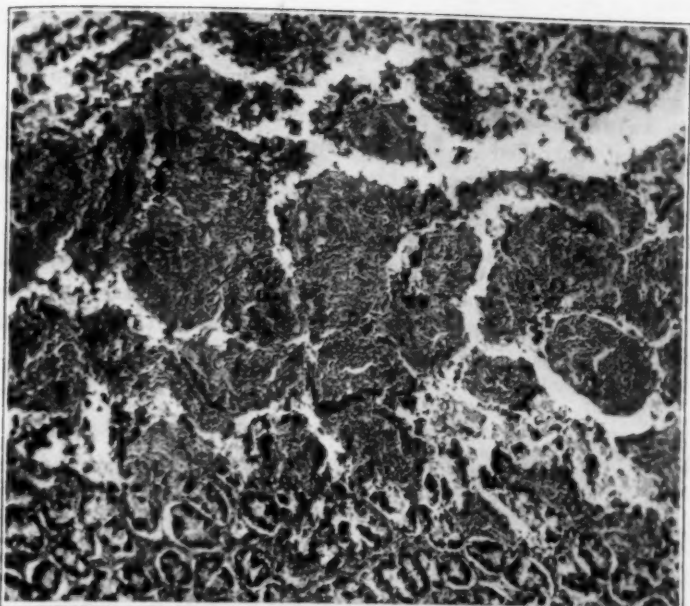


Fig. 9 (above). Colon from case of treponemiasis. Desquamation and loss of structure in villi. (Eosin-methylene blue. x 70).

Fig. 10 (below). Same slide as figure 9. A Lieberkuhn gland showing two treponema in focus. (Levaditi, x 900).

seemed to be brought about by streptococcic pneumonia. A mucodesquamative enteritis associated with tissue-invading spirochetal organisms resembling *Treponema eurygyrata* was found as the sole pathologic explanation of the principal syndrome.

In accordance with our present knowledge, canine leptospirosis should be controlled by sanitary measures against carrier rats, and by specific biologics, which are not now available in this country. Since recovered dogs may occasionally become carriers and, since man and animals may acquire the infection from a common source, canine leptospirosis is of real public health significance. The clinical recognition of intestinal treponemiasis in dogs may be of importance, because such conditions can be influenced therapeutically with arsenical preparations.

REFERENCES

- ¹Davis, R. H., Winn, J. D., and Jungherr, E.: Infectious jaundice of dogs found in Connecticut. Lederle Vet. Bul., vi (1937), p. 16.
- ²Bergey, D. H.: Manual of Determinative Bacteriology. (4th ed., Williams and Wilkins Co., Baltimore, 1934), pp. 627-630.
- ³Inada, R., and Ido, Y.: A report on the discovery of the causal organism (a new species of Spirochaeta) of Weil's disease. Tokyo Iji Shinshi (Japan) No. 1908 (1915).
- ⁴Krumbein, R., and Frieling, B.: Zur Weilschen Krankheit. Deut. Med. Wchnschr., xlii (1916), p. 564.
- ⁵Courmont, J., and Durand, P.: La spirochètose icterohémorragique chez le chien. Compt. Rend. Soc. Biol., lxxix (1917), p. 275.
- ⁶Okell, C. C., Dalling, T., and Pugh, L. P.: Leptospiral jaundice in dogs (yellows). Vet. Jour., lxxxii (1925), pp. 3-35.
- ⁷Klarenbeek, A.: Leptospirosis ictero-haemorrhagiae (Weilsche Krankheit) beim Hunde. Proc. 12th Internat'l. Vet. Cong., 1934, iii, pp. 349-357 (Washington, D. C., 1935).
- ⁸Huguenin, B., and Bourgeois, E.: Ueber Leptospirosis beim Hund. Deut. Tierärztl. Wchnschr., xlii (1936), pp. 483-485.
- ⁹Verge, J.: Les spirochètoses du chien. Rev. Gén. de Méd. Vét., xlii (1935), pp. 705-711.
- ¹⁰Dunkin, G. W., and Laidlaw, P. P.: *Leptospira icterohaemorrhagica* in a fox. Rpt. Med. Res. Council, 1924-25, p. 31.
- ¹¹Macrae, D. R.: An outbreak of leptospiral jaundice in silver-fox cubs. Some postmortem observations. Vet. Rec., xiv (1934), pp. 1170-1171.
- ¹²Catachpole, A. M.: Leptospiral jaundice in silver foxes. Vet. Rec., xiv (1934), pp. 376-378.
- ¹³Nieschulz, O., and Wawo-Roentoe, F. K.: Experimental infection of horses with *Leptospira icterohaemorrhagiae*. Tijdschr. Diergeneesk., lvi (1930), pp. 282-291. (Original not seen.) Abst. Exp. Sta. Rec., lxiii (1930), p. 373.
- ¹⁴Melanidi, C., and Trortzaki, N.: Experimental icterohaemorrhagic spirochetosis of the sheep, goat and pig. Rev. Gén. de Méd. Vét., xlii (1933), pp. 76-82. (Original not seen.) Abst. Exp. Sta. Rec., lxix (1933), p. 590.
- ¹⁵Schick, H.: Ueber die Beziehungen zwischen Stuttgarter Hundeseuche und Uraemie auf Grund pathologisch-anatomischer und histochemischer Untersuchungen. Inaug. Diss., Berlin, 1931.
- ¹⁶Tscherniak, W. S., and Romanov, N. A.: Die multiplen Kalkablagerungen in den Geweben des Organismus der Hunde bei der sogenannten Stuttgarter Hundeseuche. Arch. f. Wiss. prakt. Tier., lxiii (1931), pp. 436-459.
- ¹⁷Lucet, M.: Sur la présence de Spirochaetes dans un cas de gastroenterite haemorrhagique chez le chien. Compt. Rend. Soc. Biol., cli (1910), pp. 260-262.
- ¹⁸Lukes, J.: Spirochaetosis melaenogenes canum. Tierärztl. Arch. (Prag.), vi (1926), pp. 233-250.
- ¹⁹Krivacek, O.: Spirochaetenbefunde beim Hundetyphus. Ztschr. Hyg. u. Infektr., ciii (1924), pp. 529-532.
- ²⁰Wirth, D.: Das Stuttgarter Hundeseuche-Problem. Wiener Tierärztl. Monatschr., xxii (1935), p. 129. (Original not seen.) Abst. Deut. Tierärztl. Wchnschr., xliii (1935), p. 457.
- ²¹Schlossberger, H., and Pohmann, R.: Serologische Untersuchungen ueber Stuttgarter Hundeseuche. Cent. f. Bakt., Abt. I, Orig., cxxxvi (1936), pp. 182-194.

- ²²Schueffner, W.: Recent work on leptospirosis. Trans. Roy. Soc. Trop. Med. & Hyg., xxviii (1934-35), pp. 7-31.
- ²³Topley, W. W. C., and Wilson, G. S.: The Principles of Bacteriology and Immunity. (William Wood & Co., Baltimore), (a) 1st ed., 1929, p. 1199; (b) 2nd ed., 1936, pp. 714-731 and 1445-1453.
- ²⁴Kouwenaar, W., and Wolff, J. W.: Honden als dragers von leptospira. Nederl. Tijdschr. v. Geneesk., lxxiv (1930), p. 376.
- ²⁵Schueffner, W., Kotter, G. F., and Schultsz, D.: Human infection with a canine leptospira (*L. canicola*). Geneesk. Tijdschr. Ned. Ind., lxxv (1935), pp. 534-548.
- ²⁶Noguchi, H.: The spirochetes. Jordan, E. O., and Falk, I. S. The Newer Knowledge of Bacteriology and Immunity. (University of Chicago Press, Chicago, 1928), p. 452-497.
- ²⁷Hull, T. G.: Diseases Transmitted from Animals to Man. (Chas. Thomas, Baltimore, 1930), p. 222-229.
- ²⁸Cameron, G. C., and Irwin, D. A.: *Leptospira icterohaemorrhagiae* occurrence in wild rats at Toronto. Can. Pub. Health Jour., xx (1929), pp. 386-392.
- ²⁹Ridlon, J. R.: Studies on *Leptospira icterohaemorrhagiae*. U. S. Pub. Health Rpts., xlv (1931), pp. 1-5.
- ³⁰Gardner, G.: Spirochaetes of the district of Montreal and of the province of Quebec. Can. Jour. Res., vii (1932), pp. 221-232.
- ³¹Nishiyama, M.: Ueber das Vorkommen von Darmspirochaeten bei Menschen und Tieren. Cent. f. Bakt., Abt. I, Orig., cxxxvi (1936), pp. 370-382.
- ³²Werner, H.: Ueber Befunde von Darmspirochaeten beim Menschen. Cent. f. Bakt., Abt. I, Orig., lii (1909), p. 241.
- ³³Stafford, E. S.: An eosin-methylene blue technique for rapid tissue diagnosis. Bul. Johns Hopkins Hosp., lv (1934), p. 229. Abst. Stain Tech., xi (1936), p. 83.
- ³⁴Wenyon, C. M.: Protozoology. A Manual for Medical Men, Veterinarians and Zoölogists. (Bailliere, Tindall and Cox, London, 1926), (a) p. 206; (b) pp. 1233-1288; (c) p. 1334.

Examinations for Pregnancy

The diagnosis of pregnancy in cows has assumed an important place in veterinary practice, particularly in dairy sections. Many of the older men in the profession did not have an opportunity to learn the technic of this procedure at college, so have had to acquire this knowledge from their colleagues or take special courses in the work. Many veterinarians have attained a high degree of proficiency in diagnosing pregnancy.

One very important reason why veterinarians should not neglect making examinations for pregnancy and other conditions related to breeding is found in the so-called "breeding schools" which have sprung up and are so often conducted by non-professional men. The latter claim that they are merely supplying a need which exists and which has not been recognized by veterinarians and veterinary colleges.

The practitioner can make his services much more valuable to dairymen if he will help them in their breeding problems by systematically examining cows for pregnancy and culling out the non-breeders.

Vermont started on its three-year retest program on October 4. Federal and state veterinarians are now testing herds in Washington and Lamoille counties.

THE ACTIONS OF MORPHINE ON THE HORSE

Preliminary Studies: Diacetylmorphine (Heroin), Dihydrodesoxymorphine-D (Desomorphine) and Dihydroheterocodeine*

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In a former report¹ there were presented the results of a series of studies with morphine and five derivatives of morphine upon normal horses. In discussing the problem, it was remarked that the more commonly used alkaloids of opium have proved, in a large measure, unsatisfactory as practical sedatives for the horse, since, as every veterinarian is aware, they all elicit reactions indicating marked excitement simultaneously with those of depression. Whether it is possible to bring about a satisfactory diminution in what may be called the "excitant factor" with a relative increase in the sedative action by altering the morphine molecule is the province of these studies. The present report contains the data collected subsequent to and complementing the former.

The experimental procedures have been described. Briefly, they consist in administering the various alkaloids subcutaneously to quiet horses thoroughly accustomed both to their quarters and the manipulations incident to the test. Throughout the ensuing hours, the antics of the animal are noted for the modifications indicating excitement, dullness, skin irritation (biting or rubbing) and other general effects of the administration. At regular intervals, the subject is examined for circulatory changes by palpation (pulse) and auscultation (heart), for respiratory and intestinal activity, pupillary diameter and response to the light reflex, and striated muscle reflexes. Degree of analgesia is estimated by the "skin pinching" method described in the former report. From the outcome of these tests, a conclusion is reached as to what type and degree of response is elicited in the animal.

The preparations of dihydrodesoxymorphine-D (desomorphine) and dihydroheterocodeine used in these studies were kindly prepared by the Research Laboratory of Merck and Company, Inc., Rahway, N. J., following the methods of Dr. Small and his

*This report covers a portion of a study supported in part by a grant from Merck and Company, Inc., Rahway, N. J. Received for publication, April 9, 1937.

associates.²⁻⁴ Diacetylmorphine (heroin) was obtained through an affiliation with the United States Treasury Department, Bureau of Narcotics.

Of the morphine derivatives considered here, the only one to have received any attention hitherto in connection with the horse is heroin. While at one time it enjoyed a transient reputation as being superior to morphine, this claim has been refuted so convincingly that the product has been taken off the market. According to Regenbogen, heroin is at least ten times stronger than morphine for the horse (50 mg subcutaneously evoking marked excitement) and it is without narcotising action in this species.⁵ It was decided, however, in view of the marked depressant effect of heroin compared with morphine, as determined by tests on rats,⁶ to include it in the series for a more extensive study than seems to have been accorded it elsewhere in the horse.

The same tests were applied to the other derivatives as a result of the conclusions obtained from their study in the smaller laboratory animals. Desomorphine was found to be ten times as analgesic (cats) and 15 times as depressant (rats) as morphine, but only three times as toxic (mice). Absence of emetic effect and low level of convulsant action were also claimed.⁷ Dihydroheterocodeine, about equal to morphine in the ratio between analgesic, depressant and toxic action, measured by the methods employed with desomorphine, did not seem to augment

TABLE I—*Central effects. A compilation of the results from 99 experiments.*

DRUG	DEGREES OF EFFECT WITH VARIOUS DOSES*				TYPE OF ACTION	M.E.D.†	TOTAL‡ TESTS
	NONE	SLIGHT	DISTINCT	SEVERE			
Desomorphine	0.005–0.01 (12)	0.02 (6)	0.03 (6)	0.05–0.18 (2)	Mixed	0.03	26 (6)
Heroin	0.005–0.01 (6)	0.02 (6)	0.03–0.05 (12)	0.06–0.15 (14)	Excitant Mixed	0.03	38 (8)
Dihydrohetero- codeine	0.01–0.05 (20)	0.06 (4)	0.07–0.10 (11)		Excitant	0.06	35 (6)

*Figure in parentheses refers to total number of tests.

†Minimal excitant dose; all quantities refer to milligrams of the hydrochloride per kilogram body weight.

‡Figure in parentheses refers to number of animals employed.

markedly the spinal reflexes in rats.² While the former appeared the most promising as an effective sedative, the latter was considered more as a means of determining the direction of further studies.

The results from this series of studies are summarized in tables I and II. In general the qualitative effects were identical with those described for morphine and the derivatives discussed before. The slight variations noted may be mentioned briefly in the following paragraph. Quantitative variations were to be expected in view of the known effects in this direction of the modifications in the morphine molecule. In this respect it is observed that, on the basis of the minimal excitant and minimal analgesic doses, dihydroheterocodeine agrees with dihydromorphinone (dilaudid), while desomorphine and heroin, twice as potent as the other two have the highest potency of the entire series.

TABLE II—Analgesia. A compilation of the results from 80 experiments.

DRUG	NON-ANALGESIC DOSES*	ANALGESIC DOSES†	TOTAL TESTS‡	M. A. D.§
Desomorphine	0.005-0.008 (7)	0.01-0.03 (15)	22 (6)	0.01
Heroin	0.005 (3)	0.01-0.06 (26)	29 (8)	0.01
Dihydroheterocodeine	0.01 (4)	0.02-0.10 (25)	29 (6)	0.02

*Doses under which the animals did not show any definite increased tolerance of pain, as applied by the "skin pinching" method described. All quantities refer to milligrams of the hydrochloride per kilogram body weight.

†Doses under which the animals showed definite indifference to pain. The first and second series (desomorphine and heroin) were not carried beyond the minimal excitant dose.

‡Figures in parentheses in this column refer to the number of different animals used in the entire group of tests; those in parentheses in the other columns indicate the number of tests from which the results were obtained.

§Minimal analgesic dose, as determined by the tests reported.

Qualitatively, we may consider the analgesic effect and the relative prominence of symptoms indicating a narcotising action in the course of the period of drug effect. For the former, employing the "analgesic ratio" as the criterion, we find the three derivatives with an action mutually identical and the same as for dihydromorphine and codeine. This entire group appears slightly superior to morphine and more so to the others. As to the degree of general depression apparent with the same group, the recorded impressions gathered from watching the animals

under the administrations indicate that, of the three, desomorphine was the only one to elicit dullness in sub-excitant doses and marked dullness combined with the excitation upon administration of larger doses. In this effect it seemed about the equal of morphine and dihydromorphine, and superior to the others. Heroin seemed to possess this quality to a lesser degree, the symptoms of dullness appearing now and then, but not uniformly. Dihydroheterocodeine, in common with codeine, seemed to possess only the excitant factor, judging upon the absence of symptoms to indicate dullness when this alkaloid was applied.

We have also included in this series a few tests employing apomorphine. It has been shown previously that the administration to the horse of relatively small doses of apomorphine hydrochloride, 0.1 mg per kg, is attended with symptoms of restlessness and excitement, the horse going into delirium with larger doses (ca. 1.0 mg per kg).^{5, 8} The tests carried out at this time merely revealed that the analgesic action is present with doses slightly smaller than those required to induce excitation. With these sub-excitant doses there appears almost no evidence of sedative action, as was noted in particular with morphine, dihydromorphine and desomorphine.

TABLE III—Summary. Analgesic ratio in horses.

DRUG	M.A.D.*	M.E.D.†	RATIO	TYPE OF ACTION
Morphine	0.2	0.5	2.5	Mixed‡
Dihydromorphine	0.10	0.32	3.2	Mixed
Codeine	1.0	3.0	3	Excitant only
Dihydropseudocodeine	5.0	5.5†	1.1†	None observed
Dionine	5.0	10.0(?)	2 (?)	Excitant only
Dihydromorphinone (dilaudid)	0.03	0.06	2	Mixed or excitant
Diacetylmorphine (heroin)	0.01	0.03	3	Mixed or excitant
Dihydrodesoxymorphin-D (desomorphine)	0.01	0.03	3	Mixed
Dihydroheterocodeine	0.02	0.06	3	Excitant only

* Minimal analgesic dose. All quantities refer to the hydrochloride salt in milligrams per kilogram body weight.

† Minimal excitant dose.

‡ Mixed action refers to the presence of symptoms implying depression together with those of excitation.

The main results from the study to date are collated in table III. A review of this material has convinced us that none of the eight derivatives has demonstrated a marked superiority to the original alkaloid, morphine, as a clinical sedative for the horse. Conversely, certain of them seem to be definitely contra-indi-

cated on the basis of (1) greater excitant action (codeine, dionine, dilaudid, heroin, dihydroheterocodeine), (2) bulk of dose (codeine, dionine, dihydropseudocodeine), or (3) excessive cost of manufacture (dihydropseudocodeine, desomorphine, dihydroheterocodeine). Of these factors the last may possibly be eliminated in time.

Ignoring the cost factor, we find that desomorphine and dihydromorphine apparently possess a moderate advantage over morphine, particularly in their wider analgesic ratio; also they demonstrate at least a degree of the sedative influence equal to that of morphine. Clinical trials are needed to test both these conclusions, based upon studies obtained on normal animals.

REFERENCES

- ¹Amadon and Craige: Univ. of Penn. Vet. Ext. Quart., xxxvi (1935), 3, p. 60.
- ²Eddy: Jour. Phar. & Exp. Therap., iv (1935), p. 127.
- ³Small and Lutz: Chemistry of the opium alkaloids. U. S. Pub. Health Rpt. Suppl. 103, 1932.
- ⁴Small, Yuen and Eilers: Jour. Amer. Chem. Soc., lv (1933), p. 3863.
- ⁵Fröhner: Lehrbuch der Arzneimittellehre für Tierärzte. (13th ed., Stuttgart, 1929).
- ⁶Eddy and Howes: Jour. Phar. & Exper. Therap., liii (1935), p. 430.
- ⁷Eddy and Howes: Jour. Phar. & Exper. Therap., lv (1935), p. 257.
- ⁸Amadon: Unpublished data from classroom experiments.

New Canadian Veterinary Journal

The first number of the *Canadian Journal of Comparative Medicine* made its appearance under date of October, 1937. This new monthly, published in the interests of veterinary science, will be under the direction of an Editorial Board consisting of Dr. T. W. M. Cameron, Director, Institute of Parasitology, MacDonald College, Quebec; Dr. Chas. A. Mitchell, Pathologist, Animal Diseases Research Institute, Hull, Quebec; Dr. R. A. McIntosh, Professor of Diseases of Animals, Obstetrics and Therapeutics, Ontario Veterinary College, Guelph, Ontario, and Dr. A. A. Etienne, President, College des Médecins Vétérinaires de la Province de Québec.

The first number contained greetings from Dr. George Hilton, Veterinary Director General of Canada. The new journal is published by the National Business Publications, Ltd., Gardenvale, Quebec. Circulation will be restricted to qualified veterinarians, libraries, laboratories and scientific institutions. Beginning with the issue of January, 1938, the subscription rate will be \$2.00 per year in Canada, the British Empire and the United States.

A CLINICAL AND PATHOLOGICAL STUDY OF NEPHRITIS IN DOGS*

By FRANK BLOOM, *Flushing, N. Y.*

INTRODUCTION

To the physician, nephritis is a disease of great frequency and importance. To the veterinarian, nephritis in dogs is probably of equal, if not greater, significance. However, a perusal of the literature, both medical and veterinary, concerning Bright's disease, indicates that the former has been well studied, while the latter, with few exceptions, has been only superficially examined. To obtain a complete understanding of any disease process, there should obviously be a close correlation between clinical and pathological studies. To discuss nephritis in dogs glibly, without laboratory and pathological considerations, as is so often done, indicates a lack of knowledge of the problems pertaining to inflammatory kidney disease.

While pathological studies are necessarily of great significance, we all prefer to make our diagnoses antemortem and not post-mortem. More specifically, the frequency of renal inflammatory lesions was well known to the older veterinary pathologists, but the clinician apparently has failed to recognize this important fact. As a result, nephritis is not commonly diagnosed and it is confused with other diseases. Not only does there exist confusion concerning its frequency and symptomatology, but most of the texts on canine diseases actually describe a type of nephritis that rarely occurs in the dog. In this discussion, the symptomatology and pathology of inflammatory kidney disease in dogs will be emphasized.

FREQUENCY

A statistical approach to the study of any disease is of paramount importance to the clinician. Veterinary pathologists are almost in universal accord that renal inflammatory lesions occur with great frequency in the dog. Joest¹ cites the following references: Porcher (1895) and Leblanc (1899), particularly emphasizing the frequency of shrunken kidneys. Davis (1908), in autopsies of 145 dogs at the Bern Veterinary High School, found kidney changes in 27 per cent. Seibel (1910) saw macroscopic kidney changes in 7 per cent of the dog autopsies at the Berlin school. Out of 250 dogs that workers in the Stockholm school examined, not less than one-third showed macroscopic kidney

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changes, and microscopically only one-fourth were normal. This research was confirmed by Pfeiffer (1912), who found that it was difficult to obtain a completely normal kidney from the dog. Henschen found the frequency of macroscopic inflammatory renal changes to be from 40 to 50 per cent in pointers and Saint Bernards, 35 to 40 per cent in terriers and Great Danes and 21 to 32 per cent in setters, spitzes, beagles and dachshunds.

The frequency of nephritides increases with age, so that in old dogs there are practically always found inflammation and inflammatory scars. Nieberle and Cohrs² state that kidney disease commonly is found and it seems to be the rule in dogs over eight years of age. According to Jacob,³ over 60 per cent of the dogs in his clinic were affected. Hoare⁴ claims that chronic nephritis lesions are very common. Workers on experimental nephritis also emphasize the great frequency of spontaneous renal changes in the dog. Ophüls⁵ found that chronic nephritis is a common disease in dogs. Dayton⁶ found microscopically one dog out of 21 with normal kidneys. MacNider⁷ found 42 dogs nephropathic in a series of 237 animals. This report is based on a series of 2,873 dogs of all ages and breeds of which 186 (6.43 per cent) suffered from nephritis. In this latter group, there was a mortality of 25.32 per cent (47 died). In all cases, the diagnosis was confirmed by blood and urine examinations and the phenolsulphonephthalein test. Postmortem examinations were performed on all deceased dogs.

PATHOLOGY

In general, diseases of the kidney can be classified into three distinct categories, namely: degenerative (nephrosis), inflammatory (nephritis) and vascular (arteriosclerotic). The parenchymatous elements, comprising the glomeruli and tubules; the vascular elements, particularly the arterioles and capillaries, and the interstitial elements, consisting of the stroma, can be involved separately or jointly. The most common renal inflammatory disease in man is glomerulonephritis, while interstitial nephritis is of minor significance, the terms hemorrhagic and parenchymatous nephritis often being used synonymously with glomerulonephritis. In the dog, interstitial nephritis is of paramount importance, while glomerulonephritis is of little account. Primary vascular lesions of the kidney also occur extremely rarely in dogs. Hutyra and Marek⁸ mention acute and chronic nephritis, the former divided into the parenchymatous and diffuse types, and the latter into the diffuse (parenchymatous, glomerulonephritis) and indurative (interstitial) forms.

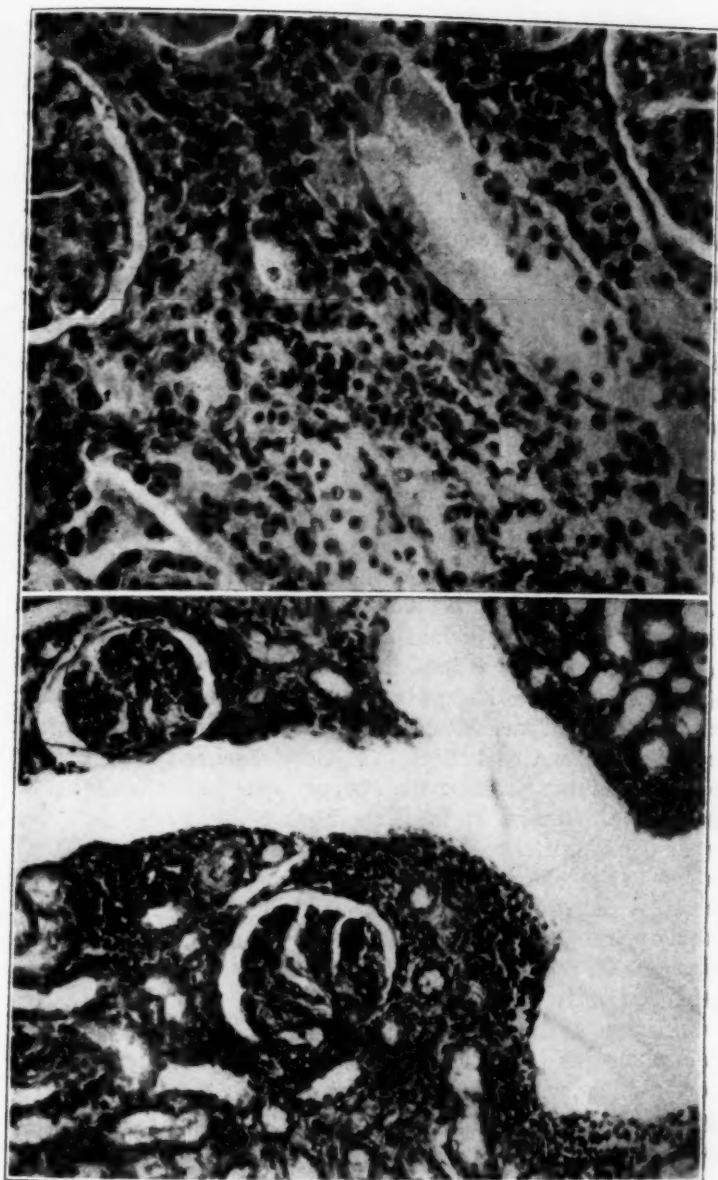


FIG. 1 (above). Diffuse intertubular infiltration with inflammatory lymphocytes. Between the two glomeruli, the longitudinal section through a convoluted tubule shows cloudy swelling of the epithelial cells and absence of nuclear staining. The glomeruli are essentially normal. (x 300).

FIG. 2 (below). Heavy lymphocytic infiltration about a vein in the cortex. Note the absence of glomerular lesions save for the inclusion of one glomerulus in the area of lymphocytic infiltration. The tubules show a moderate degree of parenchymatous degeneration. There is only a slight proliferation of the interstitial connective tissue. (x 150).

Jacob³ believes that epithelial or tubular nephrosis and nephro-cirrhosis occur most commonly. Müller and Glass⁹ classify nephritis as the acute and chronic forms. The latter is sub-divided into the parenchymatous and interstitial types, and while no classification of the former is given, it is apparent from the pathological description, that the parenchymatous type is meant. Brumley¹⁰ divides acute nephritis into three groups namely: parenchymatous, hemorrhagic parenchymatous and diffuse, while the chronic form is divided the same as by Müller and Glass. MacNider⁷ classifies the renal lesions observed in 42 naturally nephropathic dogs as chronic glomerulonephritis. However, it is difficult to reconcile such a pathological diagnosis with the type of renal changes described, as they appear to be interstitial. Essentially, the types of nephritis described above primarily occur in man and not in the dog. Capable and experienced pathologists are universally in agreement that interstitial nephritis is the most common and important inflammatory renal disease in dogs, while glomerulonephritis rarely occurs.

Interstitial nephritis occurs in the acute, subacute and chronic forms, with focal or diffuse involvement. It was first recognized by Davis, in 1908, as a special form and described as acute nephritis with interstitial, small-cell infiltration. Henschen, who wrote the chapter on kidney diseases in Joest,¹ has never seen a definite, clear-cut case of glomerulonephritis in the dog, and believes it is extremely rare and of little importance. Nieberle and Cohrs,² two other eminent pathologists, concur with Henschen's belief. Olafson,¹¹ in autopsies at the New York State Veterinary College, finds interstitial nephritis most commonly in dogs.

In my series of cases, Dr. Jean Oliver exclusively described interstitial changes and none that could remotely be considered as being primarily glomerular. There is definitely no support in the contention that the dog suffers from widespread glomerulonephritis, and from actual experience it is safe to state that interstitial nephritis is by far the most common and important inflammatory renal disease of the dog. The pathological changes observed in the writer's series of cases are as follows:

Macroscopically, the kidneys do not show striking characteristic changes, except in the chronic form. In the acute form, the kidneys may be swollen and the capsule usually strips without difficulty. The most striking change is the presence of small, pin-point or pin-head-sized areas which are circular and of a grayish-white color on the surface of the organ and particularly in the deeper parts of the cortex, and in severe cases, in the outer

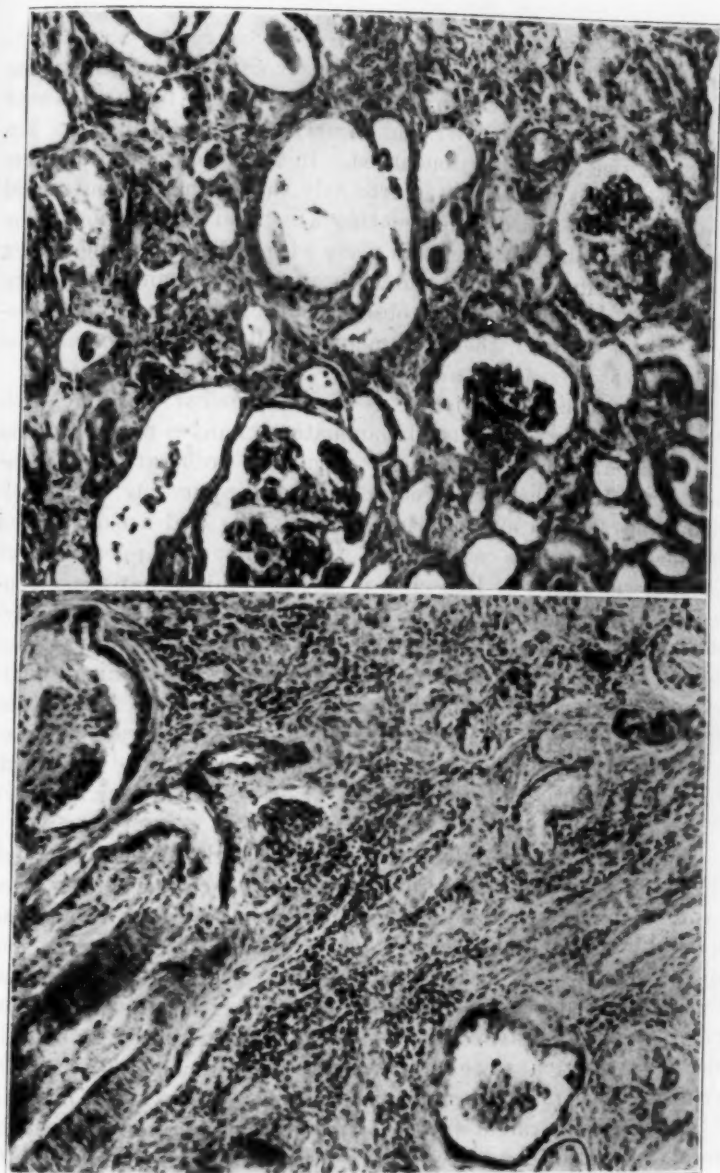


FIG. 3 (above). Cortex of kidney showing diffuse proliferation of interstitial connective tissue with scattered inflammatory infiltrations with lymphocytes. The tubules show varying distortions, from collapse to dilatation. Many of the dilated tubules are filled with hyaline material. The glomeruli show a slight periglomerular fibrosis. The tufts, except for distortion due to pressure of the surrounding scar tissue, are normal. (x 150).

FIG. 4 (below). Marked fibrosis of the cortex with areas of heavy lymphocytic infiltration. Many of the tubules have disappeared in areas of scarring. There is a marked periglomerular fibrosis. In the dense connective tissue surrounding both glomeruli and tubules, there appears a black deposit of calcium salts. (x 150).

portion of the medulla. These lesions commonly occur in the focal type and are absent in the diffuse form. In more advanced cases, the kidney is smaller and firmer, and the focal areas are larger in size and very pronounced. In advanced chronic interstitial nephritis, the kidney is definitely shrunken and contracted and is of a pale tan color presenting a nodular appearance. The capsule is usually thickened and peels with difficulty. The cortex is greatly reduced in size and both the cortical and medullary markings are indistinct and obscure. In many cases, particularly in the medulla, there are many small cyst-like formations (Kitt's *nephritis fibrovesiculosa*).

Microscopically, the picture is also somewhat variable, primarily consisting of the true inflammatory changes of infiltration and proliferation. In the acute form, the infiltration may be focal or diffuse, the former occurring most commonly. The cellular infiltrations consist of small round cells and are composed of mononuclears, the majority of which have the appearance of lymphocytes (fig. 1). Henschen is of the opinion that these represent a type intermediary between the lymphocytes and polyblasts, while Nieberle and Cohrs² believe that they are histiocytes. In the focal form, the cellular collections occur in scattered areas, particularly in the cortex, and in severe cases, in the outer portion of the medulla. These focal infiltrations may occur between the tubules (intertubular), around the glomeruli (periglomerular) and around the blood-vessels (perivascular) (fig. 2).

The glomeruli and tubules are usually little affected, though the latter may show moderate degenerative changes. In some cases, the infiltration is more diffuse from the beginning, and it is particularly dense in the lower depths of the cortex and the outer stripe of the outer zone of the medulla. Many times, there is present greater concentration of interstitial cells at focal points with the diffuse involvement. The convoluted tubules in the lower portion of the cortex and the outer medulla usually evidence moderate degeneration and, in some cases, necrosis (fig. 1). The straight tubules often contain hyaline casts. The focal infiltrations may completely disappear or may heal with slight scar formation. This is probably true also of the diffuse form.

The subacute and chronic types usually develop from the acute form. If the cellular collections do not disappear by dissolution and resorption, fibroblasts appear in increasing numbers and lead to the formation of connective tissue. The tubules included in these scars may collapse, atrophy and disappear. The epi-

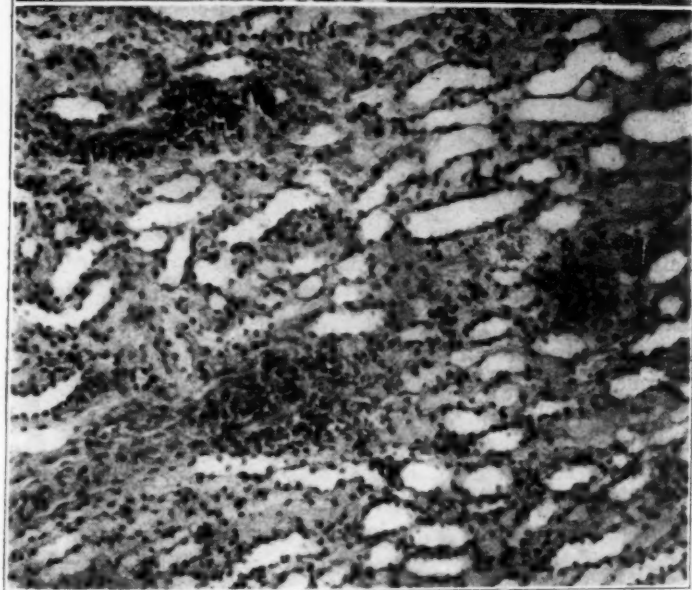
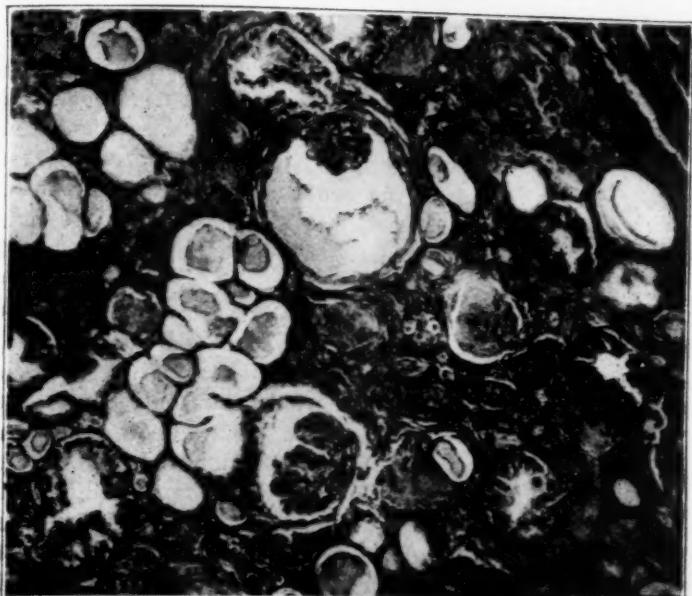


FIG. 5 (above). Extreme fibrosis of the cortex. The glomeruli show all degrees of distortion, some being reduced to hyaline fibrous masses while others show a marked dilatation of Bowman's space and compression of the tuft. The tubules have disappeared in some areas of inflammatory scar; others are greatly dilated. Their epithelium has been reduced to a thin atrophic layer and their lumen filled with hyaline material. Other tubules show an extreme hypertrophy, their epithelium being hyperplastic and changed to a columnar type. (x 150).

FIG. 6 (below). The cortex in this kidney showed only remains of a lymphocytic interstitial inflammatory process. The outer stripe of the outer zone of the medulla is shown in the figure. Focal areas of inflammatory infiltration with lymphocytes persist. In these areas the collecting tubules have disappeared. (x 150).

thelium of these tubules is atrophied and there is replacement of it by a type of epithelium that is immature in appearance. In these fibrous areas, the lymphocytes usually occur in fewer numbers. In some cases, the inflammatory process does not proceed further and the kidney has the appearance of having gone through an attack of interstitial nephritis that has healed (fig. 6).

In most cases, however, the inflammatory process is continuous with the formation of fresh infiltrations which also go on to healing and scarring until the kidney is extensively involved, with the ultimate formation of a shrunken or contracted kidney. In earlier stages of this process, some tubules show an extreme irregular dilatation with atrophied epithelium and hyaline casts in the areas of fibrosis. About them the inflammatory infiltration is more intense. If glomeruli are included in the scar, Bowman's space is distended and may be filled with coagulated material. All such included glomeruli show a greater or less periglomerular fibrosis, but the tufts, except when collapsed, are relatively well preserved (fig. 3).

Outside the scars, the parenchyma is essentially of a normal appearance and the tubular epithelium is somewhat hypertrophied. In the inflammatory scar in the outer part of the medulla, there are many irregularly dilated tubules (fig. 7). The majority of these are collecting tubules that show cystic irregular dilatation and about them the inflammatory infiltration is more intense (fig. 8). As the condition advances, the entire cortex becomes heavily infiltrated with round cells, although there are focal areas where it is more intense, and in these the parenchymal elements have been practically replaced by it. The pericapsular tissue shows definite collagenous thickening and this is many times infiltrated with calcareous material. Similar calcareous deposits are noted around atrophied tubules (fig. 4).

In the terminal stages, large areas of the cortex have been transformed into dense masses of fibrous collagen, in which enormously dilated tubules with an extremely flattened epithelium persist. The majority of these are filled with a hyaline material. In other tubules, the epithelium is tremendously hypertrophied, the epithelium having assumed a columnar shape that gives the appearance of gland-like structures (fig. 5). Some glomeruli are collapsed, atrophied and distorted by the periglomerular connective tissue. In others, there is great distension of Bowman's capsule with compression and collapse of the tuft, and still others are reduced to hyaline fibrous masses. In the outer stripe of the outer zone of the medulla, all semblance of the normal

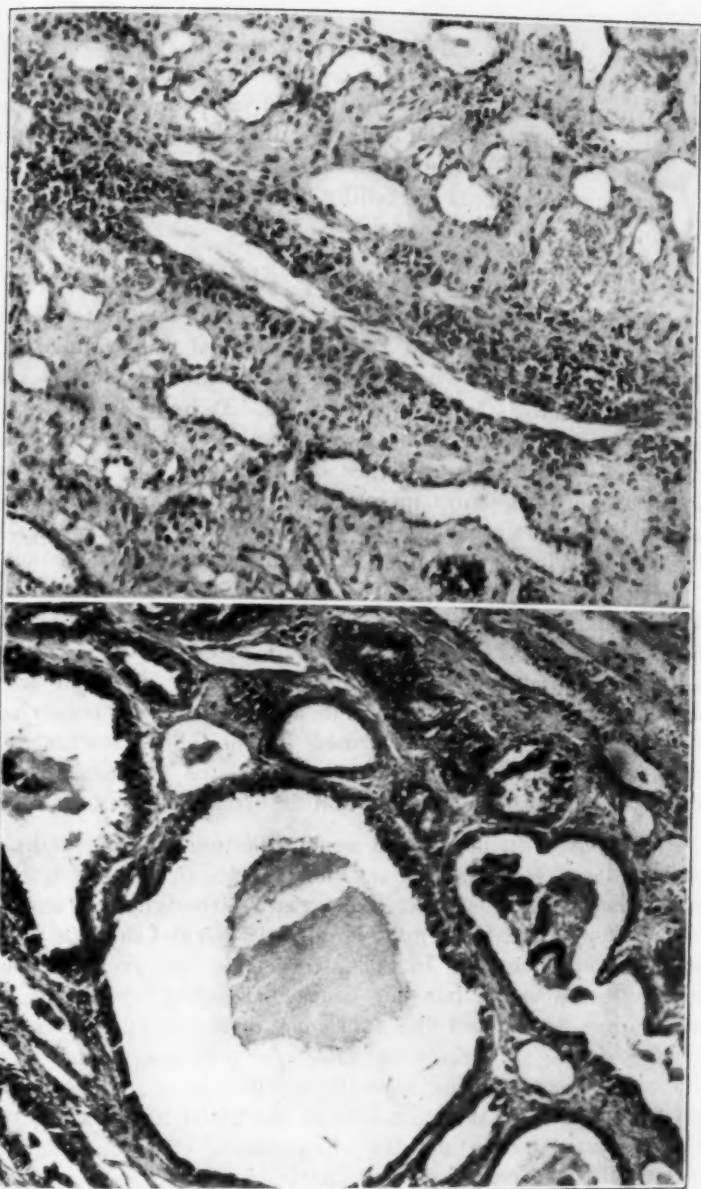


FIG. 7 (above). The outer stripe of the outer zone of the medulla, showing more intense inflammatory infiltration, especially about the vessel cut in longitudinal section. There is a diffuse proliferation of the intertubular connective tissue. Many of the collecting tubules are definitely dilated. (x 150).

FIG. 8 (below). Another area of the same region of the same kidney as figure 7. The inflammatory infiltration is accompanied by marked increase in connective tissue. The collecting tubules are greatly distended and transformed to cystic spaces lined by hyperplastic epithelium. They contain hyaline material. (x 150).

appearance has disappeared and the area is filled with cystic irregular spaces lined by a high columnar epithelium (fig. 9). The lumen of these spaces is filled with hyaline material. Exuding from the surface of the epithelium are droplets of a similar clear hyaline material (fig. 10). The arteries are entirely normal and show no fibrous thickening of their intima, even though surrounded by inflammatory tissue.

PATHOLOGICAL PHYSIOLOGY OF RENAL FUNCTION

In order to understand completely the *modus operandi* of renal disease, it is essential that the physiological functions of the kidney in Bright's disease be known. The kidney plays several important functions in the animal body. It helps maintain the constancy of the osmotic pressure, alkalinity and acidity and other physico-chemical properties of the blood. By beta-oxidation, the kidney destroys intermediary products of protein and fat metabolism such as beta-oxybutyric, diacetic and other aromatic acids. It also possesses a synthetic function (ammonia, hippuric acid). The claims that the kidney elaborates an internal secretion have not been definitely proven. However, the most important function of the kidney is excretion. The synthetic and non-excretory functions can probably be regarded as preliminary steps in excretion. The kidney transfers the urinary constituents that occur preformed in the blood to the renal pelvis. In this process, these substances are unchanged chemically, although their concentration is often different.

If there is a disturbance of renal function, there usually results an increase of the urinary constituents in the blood with a corresponding deficiency in the urine, although the chemical composition of the blood may be entirely normal despite the defective renal function. In the latter cases, the great factor of safety of the organ has not been encroached upon, the food intake does not exceed the functional activity of the kidneys, and a relative polyuria (compensatory polyuria) balances the diminished concentrating capacity of the kidney. They nitrogenous substances that accumulate in the blood in defective renal function are of the greatest importance clinically, and the terms "nitrogen retention" and "azotemia" have been applied to this state. In both the normal and nephritic, the degree of nitrogen accumulation depends on the functional renal activity, rate of protein catabolism, urine volume and the ability to concentrate the urine. These factors must all be considered in the interpretation of nitrogen retention.

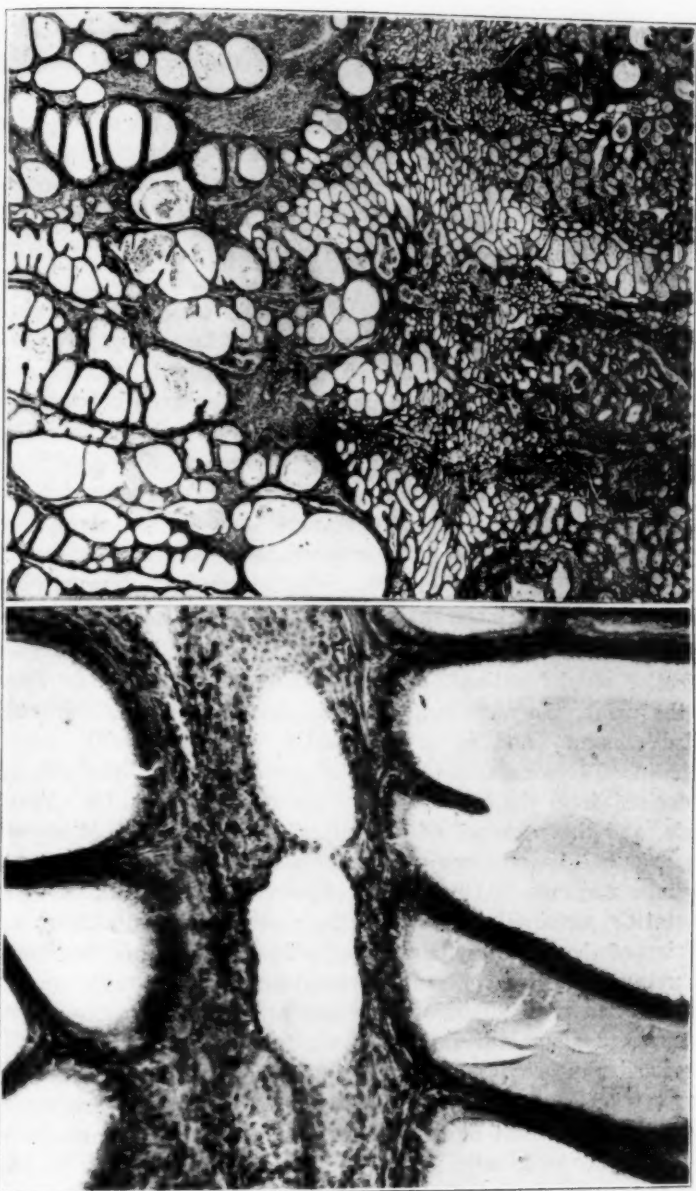


FIG. 9 (above). Parts of the cortex and outer stripe of the outer zone. The extent and degree of cortical scarring is shown. The outer stripe of the outer zone is completely transformed by the extreme cystic dilatation of the collecting tubules. These may be seen extending up through the cortex toward the surface of the kidney, in irregular columns. (x 20).

FIG. 10 (below). A greater magnification of the cystic structures in the outer stripe of the outer zone of the medulla. Note the high hyperplastic columnar epithelium that lines the cystic spaces. About the cysts there is a marked fibrosis and lymphocytic infiltration. (x 150).

Marked azotemia may occur in spite of the fact that the kidneys are functionally intact. This retention has no relationship with the kidneys, which are essentially normal, and arises from extrarenal factors. These so-called prerenal azotemias may be present in severe vomiting and diarrhea with subsequent dehydration, peripheral circulatory failure (shock), intestinal obstruction, prostatic obstruction, pneumonias, other severe infections, cardiac failure, etc.

The functional activities of the kidneys can be determined in several different ways, and they are best classified as follows: 1. The presence of abnormal urinary constituents, such as albumin, casts, etc. 2. Altered physiological balance between the blood and urine, which depends on analysis of the blood or urine, or both. 3. The eliminating power of the kidney, as tested by the administration of natural substances such as water, urea, etc., and foreign substances such as phenolsulphonephthalein, etc. Opinions differ somewhat as to the relative efficiency of each of these groups, although it is universally admitted that they all have their advantages.

The presence of albumin and casts has long been known in defective renal function. Although many proteins can be found in the urine, the most important is serum-albumin, commonly called albumin, and it is frequently combined with serum-globulin. The consensus is that the greater part of the albumin is derived from the blood. There are many causes for albuminuria, and the presence of albumin does not prove kidney disease, nor does its absence exclude nephritis. A positive test for albumin may result from pus corpuscles in pyelitis, cystitis, prostatitis, urethritis and vaginitis, and hemorrhage from any portion of the genito-urinary tract. These are called accidental albuminurias. Passive renal congestion, without any organic changes and with albumin, produces a functional albuminuria. Alimentary albuminuria may result from a heavy protein intake, and physiological albuminuria occurs in fright, cold bathing, excessive exercise, etc. There are no data concerning the presence of postural or orthostatic albuminuria in dogs.

Casts were originally found in the urine by Henle, in 1842, and are probably the products of an albuminous exudate from the blood-vessels with the addition of swollen and destroyed epithelium. Besides nephritis, they may be found also in renal hyperemia, gastro-intestinal catarrh, jaundice, acute and chronic anemia, as well as in nervous affections of various kinds. The presence of leukocytes in the urine, except in very large num-

bers, is of little significance because most dogs suffer some degree of preputial catarrh, and this serves to contaminate the specimen. Also, in bitches, there is usually found a mucopurulent exudate in the vagina on catheterization. The color and appearance of the urine in nephritis is comparatively of little importance except in the chronic form, where it is a very pale yellow color. In acute interstitial nephritis, the specific gravity of the urine lies within the normal range, while in the chronic form, it is usually lowered. Although the presence of albumin and casts is of importance, they give but little information concerning the true metabolic processes that are going on and the exact state of renal function.

While some information on the kidney efficiency may be obtained by quantitative urine analysis, it was deemed advisable to dispense with this procedure for practical purposes. No conclusive data could be obtained unless the diet was known and of some standard type, as no inference may be drawn from the urea excretion, since the two vary directly with each other. Furthermore, no reliance may be placed on less than an accurate 24-hour sample. The analysis of isolated urine samples is of no significance and is an actual waste of time.

Quantitative analysis of the blood is perhaps the most useful method as to the diagnosis and prognosis of renal disease, particularly in decompensated impairment of kidney function (renal insufficiency). The non-protein substances (NPN) are most frequently tested for and comprise the urea N, creatine, creatinine, ammonia, amino-acids, uric acid and undetermined nitrogen. The NPN is the term applied to the nitrogen that is not thrown down by the usual protein precipitants, and as a rule the urea N makes up about one-half of the NPN, but frequently the former rises proportionally more than the latter.

For practical purposes it is necessary to determine only the NPN or the urea N. Theoretically, the estimation of the urea N is to be preferred, because its concentration in the blood and tissues is about the same, while there is a greater amount of NPN in the tissues than in the blood. Urea also covers a wider range of variation in disease; it is a single chemical compound rather than a mixture of partially undetermined composition; and it is simpler to determine, particularly if direct nesslerization of the Folin-Wu filtrate is done. It is undoubtedly true that the blood chemical tests represent the exact condition of the kidneys over a long period of time, but it must not be forgotten that nitrogen retention may result from prerenal causes, and that the NPN may be normal in compensated kidney disease.

Phenolsulphonephthalein (PSP) is the principal dye test of renal function used in this country. It is non-irritating when injected, is almost completely excreted in the urine in which it quickly appears, and produces a bright-red color in alkaline solution which readily lends itself to colorimetric determination. In renal insufficiency, the output of the dye is greatly diminished in very severe cases being almost zero. The PSP test determines the function of the kidney for the moment and does not represent the condition as far as the actual retention of objectionable constituents is concerned. The phthalein test may be normal in severe kidney disease, particularly in the compensated phase, and may be greatly decreased in cardiac decompensation with chronic passive congestion of the kidneys. Despite this, the PSP test is of great value and has great merit in estimating the functional activity of the kidneys.

The experience of medical clinicians has proven that there is no one method that is absolutely positive in the diagnosis of nephritis. And many times, even though laboratory procedures are utilized to their fullest extent, the diagnosis is still tentative. It is only by a careful consideration of the clinical signs, together with intelligent interpretation of the results of blood and urine tests and the PSP test, that the correct diagnosis can be arrived at, and even then, it is probable that many cases of nephritis will be missed. The practice of diagnosing nephritis only on the results of a urine examination, or on clinical signs alone, is extremely productive of errors and should be condemned.

SYMPTOMATOLOGY

In the writer's opinion, the entire clinical aspect of nephritis in the dog depends on the functional activity of the kidneys and, in many cases, this bears little relationship to the degree of observable pathological-anatomical changes. A dog may die of complete renal failure and yet large amounts of apparently healthy renal parenchyma may exist, while in others, the renal pathology is commensurate with the symptomatology, and in still others, the renal function is good in spite of marked pathological renal changes. A consideration of the clinical-pathological features of nephritis in dogs indicates that these cases fall into three large categories.

1. Many cases of nephritis cannot be recognized clinically; these are healed or latent, and without sufficient damage to the kidney function to cause any symptoms. This may also explain the above-mentioned frequency of pathological changes without clinical recognition.

2. Other cases suffer from an acute impairment of renal function with symptoms of acute uremia. A serious omission of the textbooks is that of the importance of following the urine and blood chemistry and the PSP from day to day as a prognostic sign. These cases may survive or terminate in death.

3. Others have suffered moderate or even severe kidney damage, but the organ has retained its power to compensate by polyuria, diarrhea and vomiting (a questionable vicarious means of excreting urea), with only moderate NPN retention in the blood. These may live many years in the compensated state, showing few, if any, symptoms; or they may be slowly progressive and show signs of weakness, vomiting, diarrhea, loss of weight, and other symptoms until definite uremia terminates them, or they may be supervened by an acute uremia (an acute flare-up or exacerbation).

Veterinary text-books give an erroneous concept of nephritis in the dog. As we have seen and described above, the pathological studies applied to man have been transposed to dogs; in the same way, the clinical signs of nephritis in man have been applied to the dog. In human nephritis, kidney failure results in:

1. Fever, hematuria, etc.
2. Hypertension, cardiac and vascular changes.*
3. Edema and fluid retention, cerebral edema, papilloedema, etc.*
4. Nitrogen retention, acidosis, uremia, etc.

Fever rarely occurs in canine nephritis, though it is usual in human nephritis, and in those of the writer's cases in which it did occur, there were associated other conditions which were probably responsible for the hyperthermia. In fact, in severe uremia, the temperature is lowered or subnormal, and not elevated.

Hematuria is likewise a rare finding; examination of the urinary sediment for red cells and application of the benzidine test for occult blood were negative in most cases. In glomerulonephritis in man, hematuria is almost constantly found, and its source is probably rupture into the capsular space of the glomerular loops which are injured though still permeable. It is therefore difficult to understand how hematuria can commonly occur in interstitial nephritis when, in most cases, the glomeruli are normal, and when they are affected, there are no changes comparable to those present in glomerulonephritis.

*In the writer's cases, ophthalmoscopic examination of the fundi was always negative. Albuminuric retinitis and papilloedema were never observed

The occurrence of hypertension is dubious. According to Joest,¹ most of the cases, in which high blood-pressure was observed, were not autopsied and, accordingly, any conclusions as to its occurrence in nephritis must be questioned. Miller and Apfelbach¹² obtained inconstant and variable results in blood-pressure determinations in normal and artificially nephropathic dogs. Cardiac hypertrophy in nephritis must always be preceded by hypertension. In the writer's cases of nephritis, only one animal showed a definite hypertrophy of the heart, and this was associated with a chronic valvular endocarditis which was probably responsible for the heart enlargement. In the estimation of cardiac hypertrophy, consideration must be made for the size and the breed of the dog with their variable normal values. This fact has apparently not been taken into account by most authors. The writer believes that hypertension and cardiac hypertrophy occur infrequently in interstitial nephritis and the explanation for this probably lies in the fact that the glomeruli are only secondarily affected and, in many cases, a large number are intact, particularly in the focal type.

Edema has also been described as occurring in canine nephritis but the writer has never seen it in acute interstitial nephritis and rarely in the chronic type. Most of the cases of ascites seen in dogs were not of renal origin, as evidenced by blood and urine examinations and autopsy findings.

We must consider uremia as the essential symptom of nephritis in the dog and must intelligently appreciate the attempts of the kidney to compensate and rid itself of it. The modern concept of true uremia is that it is the symptom-complex resulting from the retention of urinary constituents in the blood. In other words, there is always a high nitrogen retention due to defective renal function; without this being present, true uremia cannot exist. The exact mechanism by which inadequate renal function produces the clinical picture of uremia is unknown. At one time or other, practically every urinary constituent has been incriminated. More recently, Becher¹³ found that the symptoms of uremia parallel the degree of retention of products of intestinal putrefaction, such as indican, phenols, aromatic oxyacids, etc. Other investigators place great stress on the presence of unknown toxic urinary constituents in the causation of uremia. Changes in the osmotic pressure of the blood have been implicated by others. In view of the foregoing, uremia can probably be considered as a complex auto-intoxication, the clinical picture resulting from the effects of the retention of

the various urinary constituents which are largely the end-products of protein catabolism. The symptoms of both acute and chronic uremia fall into several distinct groups such as nervous, alimentary tract, skin, blood, etc. The principal difference between the acute and chronic forms is that of duration and severity.

The nervous manifestations of uremia are principally apathy, listlessness, depression, weakness, drowsiness, langour and a coma-like state. Widal designated these symptoms as a veritable narcosis. Asthenia is a dominant clinical sign. Of course, not all dogs show the same intensity of the above-mentioned symptoms, but all will show them to some extent. In some cases, there are muscular twitchings of the fibrillary type that may affect the head, extremities or both. In one case, the author observed a partial unilateral vestibular paralysis and a horizontal nystagmus. Convulsions were never observed, though Hutyra and Marek⁸ state that epileptoid attacks occur.

In most cases, a congestion of the scleral conjunctiva has been observed. The only writer to observe this besides the author was Chambers,¹⁴ who describes a congestion of the mucous membranes. This congestion is well marked in the acute forms and acute exacerbations of the subacute and chronic types, though it may be entirely absent in the latter. It consists of a linear streaking and hyperemia of the conjunctiva overlying the sclera, and is not dependent on any local ocular condition.

Emaciation is universally found in uremia, and is most marked in the long-drawn-out, chronic, interstitial type. In these cases, there is marked protein destruction resulting in extensive muscle wasting, producing weakness and fatigue on the slightest exertion.

Pain in the lumbar region is very common in acute interstitial nephritis and may radiate to the entire abdominal region and the posterior extremities. The back is often arched and the gait is usually stiff, with the hind legs extended. The animal cries and groans on palpation of the abdominal region and the kidneys. Difficulty is experienced in rising from the recumbent position and in going up and down stairs. The pain and tenderness are due either to stretching of the renal capsule by the swollen kidney or to inflammatory involvement of the capsule.

The symptoms referable to the alimentary tract are of the greatest importance, as in many cases they dominate the entire clinical picture, and consist of stomatitis, anorexia, polydipsia, vomiting, constipation or diarrhea. In rapidly fatal cases, there will usually be found an ammoniacal mouth odor which is ab-

sent in the milder forms. In the former, there sometimes develops a necrotic stomatitis, which is principally confined to the tongue. Ulceration of the lips and cheeks and loosening of the teeth also occur. The stomatitis and mouth odor are more marked and more severe in chronic interstitial nephritis, and result from the formation of ammonia from the high urea content of the oral tissues by contact with air or the urea-splitting organism. Great thirst is usually present in the chronic form, which is due to dehydration of the tissues by the polyuria. In the acute form also, thirst is present and is very marked in some cases and probably results from the dehydration caused by the vomiting. Anorexia is a fairly constant sign; being complete in fatal cases, partial in less severe cases, and intermittent in those that show chronicity.

Contrary to the opinion of most authors, the writer finds that vomiting is the most constant symptom of nephritis, being present in almost all cases. It may occur after eating, drinking or on an empty stomach, and may consist of food, mucus or watery fluid. In fatal cases, the vomiting is constant and particularly severe, the animals being unable to retain food, liquids or medication. In chronic nephritis with mild uremia, the vomiting is intermittent and occurs at irregular intervals. The intense vomiting seems to be of central origin, resulting from stimulation of the vomiting center by the toxemia. Attempts to desensitize the stomach with cocaine or other drugs, by the writer, have had no effect on reducing the emesis.

On autopsy, catarrhal gastritis and hemorrhagic areas will be found in most cases. Diarrhea, when present, is the most striking intestinal symptom of uremia, though in many cases it does not occur, or is preceded by constipation. In others, constipation is the rule and is very marked. In diarrhea, the evacuations may be watery, mucoid or bloody, accompanied in severe cases by tenesmus and abdominal cramps. In acute interstitial nephritis, constipation is more common than diarrhea, and in mild chronic uremia, the diarrhea is usually intermittent. On autopsy, there is usually seen a catarrhal enteritis, many hemorrhagic areas and, in a few cases, intestinal ulceration. There are several explanations for the vomiting and diarrhea. Some are of the opinion that the stomach and intestines excrete nitrogenous substances as a vicarious function and the urea in contact with air or the urea-splitting organism produces ammonia. Others believe that the toxic nephritic condition lowers the general bodily resistance, thus offering a locus for the development of secondary infection in the stomach and intestines.

Pruritus is occasionally observed in chronic uremia and probably results from the toxemia associated with the azotemia. According to Schindelka,¹⁵ eczema occasionally occurs in chronic nephritis. While some of the writer's cases also suffered from eczematous eruptions, it is difficult to state whether they were of nephritic origin, as the skin lesions were similar to those that occur in dogs without nephritis. The presence of eczema and nephritis simultaneously is not presumptive evidence that the skin lesions are of renal origin. In fact, some observers believe that the eczema is instrumental in producing the nephritis. In one of the writer's cases, there was observed an extensive ecchymosis of the skin, which can probably be classified as a uremic eruption (uremide) of the hemorrhagic erythema class.

Anemia is usually present in chronic nephritis which is of the secondary type and is believed to result from depression of the bone-marrow function and not to increased hemolysis. In some, the anemia is very severe but it is absent in the acute interstitial type. In one of the writer's cases, the red-cell count was greatly decreased, hemoglobin was 67 per cent, and reticulocytes were absent on vital staining.

The urinary changes principally consist of the presence of albumin and casts. There is no constancy in the amount of albumin, though usually, in the chronic form, it occurs in smaller amounts and is variable from day to day. The types of casts are of no differential diagnostic significance and they may be entirely absent in chronic interstitial nephritis. As we have stated previously, the specific gravity of the urine in acute nephritis is within the normal range, while in the chronic form it is low. The amount of urine voided is of distinct importance. In chronic interstitial nephritis, a marked polyuria exists which is of a compensatory nature. In acute interstitial nephritis and in acute flare-ups of the chronic form, oliguria and anuria may develop. This signifies renal failure and is a bad prognostic sign.

DIFFERENTIAL DIAGNOSIS

As we have seen, the symptoms of nephritis offer no pathognomonic features in the great majority of cases, and in many instances the clinical signs are referable to other organs or systems of organs. In the writer's experience, the diseases that can be confused with the nephritic syndrome are various gastric disorders such as gastric catarrh, gastritis, foreign bodies in the stomach, vomiting from any cause and functional gastric disorders, diseases of the intestines such as constipation, parasites,

catarrh and enteritis and acute intestinal obstruction, prostatitis, metritis, pyelitis, so-called toxemia and toxicosis, black tongue, Stuttgart disease, peritonitis, poisoning, pancreatitis and other conditions whose clinical signs resemble those of nephritis. Severe nephrosis, particularly the necrotizing type, and pyelonephritis may also produce uremia. It is only by the use of blood and urine examinations and the PSP test that nephritis can be definitely diagnosed. Routine blood and urine tests are unnecessary and only those cases should be selected that evidence nephritic symptoms. As clinicians, we are primarily interested in picking up those animals that show renal insufficiency, as these are the ones that show symptoms and are brought in for treatment. We are not fundamentally interested in those that show renal pathological changes that are healed or compensated and show no clinical signs, but we should be cognizant of the fact that they occur very frequently and may later develop renal insufficiency.

CONCLUSIONS

1. Pathologically, nephritis occurs frequently in the dog, but clinically, it is usually not recognized.
2. The type of nephritis that occurs is principally of the interstitial variety with either focal or diffuse involvement and may be acute, subacute or chronic.
3. Clinically, the manifestations are principally of a uremic nature, and in most instances are indefinite and variable.
4. Recognition of nephritis is difficult, and in most cases impossible without conducting blood and urine examinations and renal function tests.

ACKNOWLEDGMENTS

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REFERENCES

- ¹Joest, E.: *Spezielle Pathologische Anatomie der Haustiere*. (R. Schoetz, Berlin, 1924) iii, p. 281.
- ²Nieberle, K., and Cohrs, P.: *Lehrbuch der Speziellen Pathologischen Anatomie der Haustiere*. (Gustav-Fischer, Jena, 1931), p. 500.
- ³Jakob, H.: *Innere Krankheiten des Hundes*. (F. Enke, Stuttgart, 1924), p. 513.
- ⁴Hoare, E. W.: Chronic nephritis in the dog. *Vet. Jour.*, lxxvi (1910), p. 541.
- ⁵Ophüls, W.: Some interesting points in regard to experimental chronic nephritis. *Jour. Med. Res.*, xviii (1908), p. 497.
- ⁶Dayton, H.: Reliability of dogs as subjects for experimental nephritis. *Jour. Med. Res.*, xxxi (1914), p. 177.
- ⁷MacNider, Wm. deB.: A pathological study of the naturally acquired chronic nephropathy of the dog. *Jour. Med. Res.*, xxxiv (1916), p. 177.

⁸Hutyrá, F., and Marek, J.: Pathology and Therapeutics of the Diseases of Domestic Animals. (Alexander Eger, Chicago, 1926) iii, p. 24.

⁹Müller, G., and Glass A.: Diseases of the Dog. (Alexander Eger, Chicago, 1926), p. 276.

¹⁰Brumley, O. V.: Diseases of the Small Domestic Animals. (Lea and Febiger, Philadelphia, 1931), p. 370.

¹¹Olafson, P.: Personal communication.

¹²Miller, E. M., and Apfelbach, C. W.: Experimental infarction of the glomeruli in dogs. Arch. Path. & Lab. Med., iv (1927), p. 193.

¹³Becher, E.: Ueber das Vorkommen von aromatischen Oxy-säuren und Phenolen im einteiweissten Blut und über die Bedeutung derselben bei echter Uramie. Deut. Arch. f. Klin. Med., cxlv (1924), p. 333.

¹⁴Chambers, F.: Specific nephritis (?). Vet. Rec., viii (1928), p. 413.

¹⁵Schindelka: Quoted by Joest.¹

Filled Milk Act Declared Unconstitutional

The Federal Filled Milk Act which became a law on March 4, 1923, has been declared unconstitutional by the Federal Court for the Southern District of Illinois. This act was passed by Congress for the purpose of forbidding the interstate distribution of any combination of milk, cream or skim milk, with any fat or oil, other than milk fat, so as to resemble or imitate pure cream, milk or skim milk in any form.

The case arose following interstate shipment of two products manufactured at Litchfield, Ill. Analysis showed both to be composed essentially of evaporated skim milk and coconut oil in semblance of evaporated whole milk. After prosecution was instituted, the manufacturer filed a demurrer to the indictment on the grounds that the act was unconstitutional. The demurrer was sustained in the recent court decision, but the Food and Drug Administration of the U. S. Department of Agriculture has announced its purpose to seek a review of the decision by the United States Supreme Court.

Pink Arsenates

According to a note in *Medical Times*, lead arsenate and calcium arsenate, which are used quite universally in agriculture as insecticides, will hereafter be manufactured with a distinctive pink color, under a voluntary agreement of the producers of these chemicals. This safety measure has been adopted to provide a safeguard against white arsenates being mistaken for materials used for household or other purposes.

Lead arsenate now being produced for use on the 1938 crops is colored pink, while the color of calcium arsenate will also be changed from white to pink when the present stocks of the insecticide are exhausted.



ABSTRACTS

OVARIES SECRETE MALE HORMONE. R. T. Hill. Endocrin., xxi (1937), p. 495.

Grafts of ovaries in the ears of castrate male mice can cause normal growth and secretion of the seminal vesicles and prostate.

Such growth and development have never been approximated by females hormone injections. These ovarian grafts also secrete an estrogenic hormone, as shown by the response of the rudimentary mammary glands of the male host mice. A similar reaction takes place in a female providing her ovaries are grafted into her ears and she carries a grafted seminal vesicle upon which the response may be registered. Abdominal ovarian grafts did not accomplish the same results as ovaries grafted in the ear. The reaction is not specific to any particular strain of mice. The suggestion is made that the temperature of the ear which more nearly approximates that of the scrotum may be the controlling factor in the output of male hormone by an ovary grafted in the ear of castrate males.

RELATIONSHIP BETWEEN COLON BACILLI AND CECAL COCCIDIOSIS IN THE PRODUCTION OF CHRONIC COCCIDIOSIS. G. L. Ott. Abst. Poultry Sci., xvi (1937), p. 361.

Attempts were made to determine any possible relationships between secondary bacterial invasion following an acute attack of cecal coccidiosis and "going light." It was comparatively easy to isolate colon bacilli from the livers and spleens of birds following experimental infection with *Eimeria tenella*. Great difficulty was experienced in producing artificial liver lesions, as characterized in spontaneous cases of chronic coccidiosis. By artificial inoculation *per os* of bacilli isolated from the livers of birds suffering from chronic coccidiosis every day following the experimental inoculation with oöcysts of a pure line of *E. tenella*, it was determined that bacterial invasion occurred on the third and fifth days following coccidial infection, at which time the first and second generations of merozoites, respectively, were entering new epithelial cells. The greatest amount of invasion occurred

on the fifth day following coccidial infection, at which time effusive hemorrhage and sloughing of wide areas of epithelium occurs in the cecal pouches. The greatest success in the artificial production of liver lesions was reached when the birds were kept on a vitamin-free, low-maintenance diet.

THE EFFECT OF THE QUALITY OF PROTEIN ON THE ESTROUS CYCLE. P. B. Pearson, E. B. Hart and G. Bohstedt. *Jour. Nutri.* xiv (1937), p. 329.

Rats maintained on a diet containing 5 per cent casein as the chief source of protein soon cease to exhibit the characteristic vaginal changes of estrous. The anestrus period is correlated with hypotypical ovaries and an atrophic condition of the whole reproductive system. The failure of ovulation is indicated by atretic follicles and the absence of new corpora lutea. The addition of gelatin, rich in lysine, brings about only a partial response in the estrous cycle. When 5 per cent of gliadin, poor in lysine, is added to the low casein diet, ovulation occurs and the normal sexual rhythm is immediately resumed. It is evident that a deficiency of amino-acids other than lysine causes an aberration of the estrous cycle, and it seems that when the dietary protein is inadequate for growth, the sexual behavior is likewise adversely influenced. No permanent sterility results from feeding diets qualitatively or quantitatively deficient in protein if the necessary stimulus for ovulation is subsequently provided.

ON THE IDENTITY OF THE GOLDBERGER AND UNDERHILL TYPES OF CANINE BLACK TONGUE. SECONDARY FUSO-SPIROCHETAL INFECTION IN EACH. David T. Smith, Elbert L. Persons and Harold I. Harvey. *Jour. Nutri.*, xiv (1937), p. 373.

The Underhill syndrome appears in dogs receiving meat and yeast and is prevented by adequate amounts of cod-liver oil, whereas the Goldberger type of black tongue appears in dogs receiving adequate amounts of cod-liver oil and is prevented by meat or yeast. The Underhill syndrome in dogs is clinically and bacteriologically identical with Goldberger's experimental canine black tongue. The oral lesions in both the Goldberger and Underhill types of canine black tongue are the results of infection with the fuso-spirochetal group of organisms secondary to lowered tissue resistance. Dogs on the Goldberger diet may be used with confidence in assaying the pellagra-curative value of various substances because the appearance of secondary fuso-

spirochetal infection is a reliable indicator of the nutritional status.

MYIASIS IN WILD ANIMALS IN SOUTHWESTERN TEXAS. Arthur W. Lindquist. Jour. Econ. Entom., xxx (1937), p. 735.

The cottontail, the jack rabbit, the opossum and the deer were found to harbor natural infestations of the screw worm, *Cochliomyia americana*. A total of 37 cases of myiasis in wild animals were studied. The fact that wildlife serves as a considerable source of infestation of the screw worm makes its control in live stock more difficult. Four per cent of the rabbits may carry infestations of *C. americana*. The predisposing causes which render animals subject to fly attack are rabbit bots, gun shot wounds, boils, disease, birth of young, injury by predators, fighting and brush and wire cuts. Infested wild animals should be treated whenever practicable and maggot-infested carcasses promptly burned. Effective control of screw worms in live stock should result in fewer attacks on wildlife.

IS COPPER ESSENTIAL FOR IRON UTILIZATION? Lisabeth H. Beynon. Amer. Jour. Physiol., cx (1937), p. 423.

It is generally accepted that copper plays a physiological rôle in the utilization of iron for the formation of hemoglobin. The rôle of copper deficiency in anemia is not satisfactorily explained. The results of these experiments indicate that copper is not an essential element in nutrition. The excessive water content of fluid milk and its incorrect balance of protein, fat and carbohydrates makes it impossible for animals to eat sufficient food for growth and hemoglobin formation. Data are presented to indicate that the rôle of copper is to facilitate intestinal elimination.

THE EFFECTS OF TOTAL PLASMAPHERESIS AND PROTEIN REGENERATION UPON THE AGGLUTINATION TITRE IN DOGS IMMUNIZED AGAINST *B. TYPHOSUS*. James N. Etteldorf, J. B. Mitchell, Jr., and William R. Amberson. Amer. Jour. Physiol., cx (1937), p. 451.

Demonstrable antibodies can be temporarily removed from the blood by plasmapheresis (plasma removal) in dogs. The antibody titre is capable of returning to its previous level after a first and even after a second plasmapheresis. In most animals, however, the antibody titre does not return completely after

plasmapheresis. This partial failure to recover is apparently due mainly to the slow disappearance of the immune state, which is also evident in the control. The regeneration of antibodies parallels the regeneration of globulin, which suggests that antibodies are closely related to the globulin fraction of the plasma proteins.

EFFECT OF ADDING COPPER TO THE EXCLUSIVE MILK DIET USED IN THE PREPARATION OF ANEMIC RATS UPON THEIR SUBSEQUENT RESPONSE TO IRON. Margaret Cammack Smith and Louise Otis. Jour. Nutri., xiv (1937), p. 365.

Rats made severely anemic upon a whole milk diet, according to the Elvehjem-Kemmerer technic, contain residual iron which is converted into hemoglobin when copper alone is administered in adequate amounts. Animals which do not have their iron reserves depleted in the presence of copper regenerate much more hemoglobin in response to subsequent iron and copper supplementation than do rats which have been given sufficient copper in the preparation period for complete utilization of iron stores.

THE EFFECT OF TEMPERATURE ON THE VOLUME FLOW OF BLOOD THROUGH THE SYMPATHECTOMIZED PAW OF THE DOG WITH OBSERVATIONS ON THE OXYGEN CONTENT AND CAPACITY CARBON DIOXIDE CONTENT AND pH OF THE ARTERIAL AND VENOUS BLOOD. Norman E. Freeman and J. Wallace Zeller. Amer. Jour. Physiol., cxx (1937), p. 475.

The circulation through the paws of the unanesthetized trained dogs after exclusion of vasomotor factors varies directly with the temperature of the bath in which the paw is immersed. The arterio-venous oxygen and carbon dioxide differences and the pH of the arterial and venous blood are constant in any single experiment over wide ranges of blood-flow and metabolism. These observations are consistent with the hypothesis that the circulation through regions deprived of vasomotor control is determined by the metabolic needs of the tissues.

TRICHOMONIASIS OF TURKEYS. M. C. Hawn. Jour. Inf. Dis., lxi (1937), p. 184.

Trichomoniasis has been produced in 54 per cent of the turkeys inoculated with viable cultures of *Trichomonas diversa*. The cultures used were propagated in culture media for periods ranging from two days to seven months. Turkeys inoculated

with cultures in which the trichomonads had been killed by storage or evaporation failed to show microscopic evidence of the disease. It was successfully transmitted with the same cultures containing viable *T. diversa*. The disease was produced with cultures of *T. diversa* isolated from carriers. *T. diversa* is regularly found associated with the esophageal lesions in fresh pathological specimens. Mass bacterial cultures free of *T. diversa* failed to reproduce the disease. *T. diversa* localizes mainly in the upper digestive tract. It has been found frequently in the duodenum and ceca. The parasite is capable of establishing itself in the upper digestive tract of pigeons and chickens but did not produce lesions during the period of observation. It is not probable that bacteria have any direct connection in the pathogenesis of the disease which produces characteristic lesions in the esophagus and crop.

STUDY OF A PARATYPHOID INFECTION IN CHICKS. O. W. Schalm. Jour. Inf. Dis., lxi (1937), p. 208.

A disease which caused extensive losses in chicks was found to be caused by a paratyphoid organism morphologically and biochemically similar to *Salmonella typhimurium*. The indications pointed to infection in the incubators after hatching, with the organisms present in fecal contamination on the shells of eggs. That infection could take place in this manner was shown by the occurrence of the disease in chicks hatched from eggs the shells of which had been lightly painted with a mixture of a broth culture of the organism and sterilized chicken feces. It was also shown that under such conditions the organisms survived exposure to incubator temperature for as long as 111 days. Chilling was a factor in producing high mortality in some lots of naturally infected chicks. Chicks four days old were not affected by oral administration of broth cultures of the organism and chicks 63 days old were resistant to an intravenous injection of a suspension of the organism. The organism readily left the blood-stream and localized in the liver and spleen, especially the latter, from which it was recovered at intervals for as long as 125 days. The disease was successfully controlled by fumigation of the incubators with formaldehyde gas at hatching time.

THE LIFE HISTORY OF CHOANOTAENIA INFUNDIBULUM, A CESTODE PARASITIC IN CHICKENS. Margery W. Horsfall and Myrna F. Jones. Jour. Parasitol., xxiii (1937), p. 435.

The following species of new intermediate hosts for *Choanotaenia infundibulum* are reported; the beetles, *Stenocellus de-*

bilipes, *Stenolophus conjunctus*, *Alphitophagus bifasciatus*, *Apo-cellus sphaericollis*, *Ataenius cognatus*, *Aphodius* sp., *Aphodius granarius* and the grasshoppers, *Dicromorpha viridis* and *Melanoplus femurrubrum*. Laboratory-raised chickens have been infected with *C. infundibulum* by feeding their cysts from experimentally infected *A. granarius* and *M. femurrubrum*. A tail has been demonstrated in partially developed cysts from *M. femurrubrum*. At 75° to 90° F., 17 to 20 days is the minimum time for development of the cysticeroids to the infective stage in *M. femurrubrum*. In the beetle *A. granarius*, 48 days is the minimum time for the development at 60° to 75° F. Infective cysts are simple cysticeroids without a tail, with or without an external membrane and loose cells or mucoid tissue and with numerous calcareous corpuscles. Cross-infestation experiments prove that the beetle and grasshopper cysts are the same species in spite of apparent differences.

SPECIES AND INCIDENCE OF DIPTEROUS LARVAE CONCERNED IN WOUND MYIASIS. E. F. Knipling and H. T. Rainwater. Jour. Parasitol., xxiii (1937), p. 451.

Cochliomyia americana, the primary screw worm fly, was involved in approximately 90 per cent of the total number of cases of myiasis, whereas secondary species as a group were involved in approximately 13 per cent of the total number of cases. The following species and genera given in order of their incidence were taken from wounds: *C. americana*, *Phormia regina*, *Lucilia* spp., *Musca domestica*, *Cynomyia cadaverina*, *Stomoxys calcitrans*, and *Hermetia* spp. Of the species in the genus *Lucilia*, *L. sericata* was the most commonly taken in myiasis. *L. caeruleiviridis* and *L. cluvia* were also concerned in the production of myiasis. Apparently the two last-mentioned species have not previously been reported from wounds of animals. *Sarcophaga bullata* is the most common species of the Sarcophagidae concerned in myiasis in the Southeast. Secondary species as a group apparently attack a greater variety of hosts than *C. americana*. Although there are a large number of hosts for *C. americana*, cattle and swine are the principal hosts.

Lamb Prices in Chicago

In 1925, the average price of lambs on the Chicago market was \$15.50. In 1933, the average price was only \$6.40. This year the price has averaged over \$11.00.



Regular Army

Captain Curtis W. Betzold is relieved from his present assignment and duty at the Army Medical Center, Washington, D. C., effective at such time as will enable him to proceed to New York, N. Y., and sail on transport scheduled to leave that port on or about January, 1938, for the Philippine Department, for duty with the Veterinary Corps.

1st Lieut. Ray S. Hunsberger is assigned to the Army Medical Center, Washington, D. C., effective upon completion of his present tour of foreign service in the Philippine Department.

By direction of the President, 1st Lieut. Andrew J. Sirilo is honorably discharged from the service of the United States, with one year's pay, under the provisions of Section 5, of the Act of Congress approved April 23, 1908, and Section 24c of the Act of Congress approved June 4, 1920.

Lt. Colonel John H. Kintner is detailed for duty as port veterinarian, San Francisco port of embarkation, Fort Mason, Calif., in addition to his other duties at Fort Mason, Calif., vice Colonel Alfred L. Mason, hereby relieved.

1st Lieut. Velmer W. McGinnis is relieved from his present assignment and duty at the Army Medical Center, Washington, D. C., effective on or about November 3, 1937, and will proceed to Fort Slocum, N. Y., for temporary duty until such time as will enable him to sail on the transport scheduled to leave New York, N. Y., on or about March 15, 1938, for the Panama Canal Department. Upon arrival in Panama he will report to the commanding general for assignment to duty with the Veterinary Corps.

Major Laurence R. Bower is relieved from further assignment and duty at Fort George G. Meade, Md., effective in time to proceed to New York, N. Y., and sail on the transport scheduled to leave that port on or about January 6, 1938, for San Francisco, Calif.; upon arrival in San Francisco will proceed to March Field, Calif., and report for duty.

The promotion of 1st Lieut. James B. Nichols to the grade of captain, with rank from October 15, 1937, is announced.

Lt. Colonel Wm. H. Dean is detailed as attending veterinarian at Benicia Arsenal, Calif., in addition to his other duties at the Presidio of San Francisco, Calif.

The appointment of 1st Lieut. John Kenneth Allen, Veterinary Corps Reserve, Fort Snelling, Minn., as first lieutenant in the Veterinary Corps, Regular Army, with rank from October 29, 1937, and his assignment to duty at Fort Bragg, N. C., is announced.

Veterinary Corps Reserve

NEW ACCEPTANCES

Menig, Bert Albert.....1st Lt...Dept. of Agriculture, Olympia,
Wash.
Thimmig, John Wesley.....1st Lt...Wellington, Colo.
Wittrock, Jack Edward.....1st Lt...North 5017 Lacey St., Spokane,
Wash.

TERMINATION OF ASSIGNMENT TO ACTIVE DUTY WITH CCC

Bate, L. B. 1st Lt. ... Sacramento, Calif.
 Geisler, Richard E. Capt. ... Medford, Oregon.
 Allen, John Kenneth. 1st Lt. ... Fort Snelling, Minn. (Appointed
 1st Lt. in Regular Army).

Sydney University Veterinary School Establishes Farm

According to a report in the *Australian Veterinary Journal*, the Sydney University Veterinary School has established a farm of 400 acres for the training of its students in animal husbandry. A dormitory for accommodating from 25 to 30 students has been provided. Each group will spend a month on the farm during vacations and will also spend week-ends and holidays to see certain operations such as shearing and lamb marketing. All farm animals are used in the management of the farm. The experience gained on the farm will supplement the formal lectures in animal husbandry.

Bureau Transfers

DR. IRVIN MEYERS (O. S. U. '13), from Ottumwa, Iowa, to Cincinnati, Ohio, on meat inspection.

DR. S. N. STUDER (Colo. '33), from Columbia, Tenn., to Evansville, Ind., on meat inspection.

DR. GUY E. ABRAMS (O. S. U. '10), from Reno, Nev., to Olympia, Wash., on hog cholera control.

DR. LEON ABBEVAYA (Corn. '29), from New York, N. Y., to Jersey City, N. J., on meat inspection.

DR. SALMAR P. BOLSTAD (K. C. V. C. '12), from Lincoln, Neb., to Omaha, Neb., on meat inspection and Packers and Stockyards.

DR. JOHN T. DALLAS (O. S. U. '26), from Salt Lake City, Utah, to Sacramento, Calif., on tuberculosis eradication.

DR. ZENO C. BOYD (K. C. V. C. '07), from Medford, Ore., to Twin Falls, Idaho, in charge of zoological investigations.

DR. HENRY J. GOHDE (K. C. V. C. '17), from Austin, Minn., to Albert Lea, Minn., on meat inspection.

DR. FRANK C. HARRIS (A. P. I. '35), from New York, N. Y., to Memphis, Tenn., on meat inspection.

DR. ROBERT JAY (McK. '99), from Medford, Ore., to Gold Beach, Ore., in charge of zoological investigations.

DR. SEABORN H. STILL (K. C. V. C. '11), from Sacramento, Calif., to San Juan, Puerto Rico, on tuberculosis and tick eradication.

DR. GEORGE T. REAUGH (K. S. C. '16), from Oklahoma City, Okla., to Chicago, Ill., on meat inspection.

DR. R. F. GARD (K. C. V. C. '10), from Denver, Colo., to Topeka, Kan., on meat inspection.

DR. H. J. BUEHLER (Mich. '29), from Jacksonville, Fla., to Kansas City, Kan., on virus-serum control.

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Dominican Republic.	Guy A. Roberts, Box 1311, Ciudad Trujillo.
Ecuador	Roberto Plata Guerrero, Apartado 468, Guayaquil.
Egypt	J. E. Aghion, Bey, 20 Rue Senan Pacha, Zeitoun.
England	T. P. White, c/o American Consulate, 18 Cavendish Square, England.
Germany	Prof. Oskar Seifried, Institut fur Tierpathologie d. Univ. Veterinarstrasse 6, Munich.
Hungary	A. Kotlan, Royal Hungarian Veterinary College, Budapest VII.
Jamaica	Stephen Lockett, Department of Agriculture, Hope, Kingston.
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New Zealand	W. C. Ring, 16 Wyndham St., Auckland.
Peru	J. F. Mitchell, c/o Hacienda Pachacayo, Pachacayo.
Saint Kitts	E. F. Jardine, Box 34, Basseterre.
Scotland	A. W. Whitehouse, Glasgow Veterinary College, 83 Buccleuch St., Glasgow.
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Foot-and-Mouth Disease in England

In the issue of November 6, the *Veterinary Record* (London) reported the existence of foot-and-mouth disease among cattle at Beddingham, Lewes, Sussex, and at Reydon, Southwold, Suffolk. A few days later, outbreaks were confirmed at Godmersham, Canterbury, and among sheep at Feltwell, Norfolk. It was reported that, as far as the Ministry of Agriculture had been able to ascertain, there was no direct connection between these outbreaks.

The *Veterinary Record* for November 13, quoted the Ministry of Agriculture as having described the present outbreak of foot-and-mouth disease as "possibly one of the most dangerous experienced in recent years." A "standstill" order was imposed, affecting 15 eastern and southeastern counties in England, in which markets have been prohibited and deer-hunting forbidden. The *Record* went on to say that the present situation with regard to foot-and-mouth disease in Great Britain is serious and that the Ministry of Agriculture requires the help of a further number of veterinarians to supplement its staff, in addition to temporary veterinary inspectors at present employed.

Who gives himself with his alms feeds three,—
Himself, his hungering neighbor and me.

—Lowell

MISCELLANEOUS

A TWO BILLION DOLLAR LEAK

By PHILIP P. JACOBS

Christmas Seals!



Buy and Use Them

Tuberculosis is a costly disease, costly to the individual, costly to his family, costly to industry, costly to the community. All of us, tax-payers and rent-payers, must pay for sickness, whether we are ill or well. For the tuberculosis patient there are such tangible expenditures as loss of wages and income, doctor and hospital bills, besides the cost that comes from the danger of spread-

ing this disease to his friends and family.

At this very moment there are no less than 500,000 active cases of tuberculosis in the United States. This year, 1937, about 70,000 persons have died of tuberculosis, most of them young adults, for this is a young person's disease. If you will multiply 500,000 living cases by \$4,000, which is the carefully computed cost of a tuberculosis case to home, industry and community, you will get the stupendous total of two billion dollars. That's what these 500,000 cases of tuberculosis will cost you and everyone else who lives in the United States.

But most of that cost is unnecessary, since tuberculosis is a disease that can be prevented. In fact, it can be eradicated. That two billion dollars is like a leak in a great dam or dike where the water that should be saved for productive uses, runs away needlessly.

Why not stop this leak? We know how to do it; we have been able to reduce the havoc of tuberculosis from 150,000 deaths, some 30 years ago, to about 70,000 at the present time. Three decades ago, 175 persons out of every 100,000 then living died annually from tuberculosis, while today the corresponding rate is about 55.

We have learned from experience how to control tuberculosis. We know that hospitals for treatment of the disease and for health protection are our main line of defense against the disease.

We have proved that clinics, doctors, tuberculin testing and x-raying of high school and college children and young adults, together with competent public health nursing, are essential to find tuberculosis in its early curable form and to prevent its spread in home, school and industry. We know that health education in the school and in the population at large will teach people how to avoid tuberculosis, and, above all, we know that organization of community resources and of focused public opinion on the problem of tuberculosis are mighty aids in getting rid of this White Plague.

Why, then, should we allow a leak of two billion dollars to continue? It is simply because of indifference on the part of the public. Some people know how to prevent tuberculosis but everybody should know how to prevent it. The tuberculosis associations of the United States, local, state and national, have been the leaders in the fight against tuberculosis. Their biggest task is now before them. With the distinct gains that have been made in the last 30 years, many people think that tuberculosis is conquered, but this is far from being the case. Tuberculosis still is Public Enemy No. 1 among the young people of this nation. The job of conquering tuberculosis can be completed but it needs the support of every man, woman and child in the country.

The appeal of the Christmas Seal is one way in which everybody can help to fight tuberculosis. But it is only one way. Your money is greatly needed to provide the sinews of war to the fighters who are leading the attack on this disease. But more than your financial support is necessary, your moral support and your enthusiastic coöperation are also needed. Enlist today in this life-saving campaign.

Louisiana Organizes Veterinary Department

Animal disease control work at Louisiana State University has been reorganized and is now centralized in one department which is to be designated as the Department of Veterinary Science, previously called the Department of Animal Pathology. The staff of the new department consists of three veterinarians, Dr. W. T. Oglesby (Iowa '31), Head; Dr. A. H. Groth (Iowa '31) and Dr. W. C. Schofield (O. S. U. '36), and one parasitologist, Dr. R. L. Mayhew. The post office address of the Louisiana State University, formerly Baton Rouge, is now University, La.

What is not good for the swarm is not good for the bee.

—*Marcus Aurelius.*



SOUTH CAROLINA ASSOCIATION OF VETERINARIANS

The twenty-eighth annual meeting of the South Carolina Association of Veterinarians was held in Anderson, July 13-14, 1937, with an attendance of approximately 75 veterinarians. Dr. H. L. Frieze, of Gaffney, presided. Following the invocation given by Rev. Joe H. Carter, of the Central Presbyterian Church, Mayor G. Cullen Sullivan gave the address of welcome. Dr. W. A. Barnette, of Greenwood, made the response.

The program proved to be a very interesting one and the papers were freely discussed. The program follows:

President's Address, by Dr. H. L. Frieze, Gaffney.

"Internal Parasites of Small Animals and Their Treatment," by Dr. R. L. Anderes, Kansas City, Mo.

"Rabies," by Dr. W. H. Schoening, U. S. Bureau of Animal Industry, Washington, D. C.

"Treatment of Skin Diseases in the Dog," by Dr. E. B. Dibbell, Baltimore, Md.

"Lameness of Horses" (motion pictures), by Dr. W. F. Guard, Ohio State University, Columbus, Ohio.

"The A. V. M. A. and Veterinary Activities," by Col. Robert J. Foster, V. C., U. S. Army, Washington, D. C.

"Some Practical Aspects of Surgical Technic" (illustrated), by Dr. W. F. Guard, Ohio State University, Columbus, Ohio.

The evening of the first day, a banquet followed by a dance was served at the John C. Calhoun Hotel. Dr. T. L. Burriss, of Anderson, was toastmaster and called on a number of the visiting veterinarians for short talks. Hon. C. D. Earl, local attorney, was the speaker of the evening.

The morning of the second day, a clinic was held under the direction of Dr. T. L. Burriss, of Anderson, assisted by Drs. Anderes, Dibbell, Guard, Schoening and others. The General Electric Company, of Charlotte, N. Car., had a representative in attendance with an x-ray machine which was used in connection with diagnostic work. A number of cases were presented which included, horses, mules, cows, dogs, cats and one skunk. Those who attended the meeting expressed themselves as being well pleased with all phases of the program.

An invitation extended by Dr. J. H. Moore, of Charleston, for the Association to meet in that city in July, 1938, was accepted. Drs. A. R. Thiele, of Columbia, and G. W. Anderson, of Clemson, were elected to membership. Suitable resolutions were adopted on the death of Dr. Benj. McInnes, of Charleston. The Ladies' Auxiliary held a business meeting which was followed by a sight-seeing trip to the Old Stone Church and the Calhoun Mansion. A luncheon was served on the lawn of the mansion.

R. A. MAYS, *Secretary-Treasurer*.

EAST CENTRAL VETERINARY ASSOCIATION

The East Central (Iowa) Veterinary Association dinner-meeting held at Cedar Rapids, Iowa, September 9, 1937, was attended by 62 practitioners from 22 counties. This large gathering was due to the intense interest in equine encephalomyelitis in this region. All but one practitioner present had had at least one case of the disease this summer or fall. Probably 800 cases were represented at the meeting.

Dr. R. S. Gerard, of Sigourney, who has had an extensive experience with the so-called "sleeping sickness," was the headliner for the technical program. He graphically outlined a course of treatment for afflicted horses which has proven successful in a large percentage of his cases. The first thing he does is to build a rack around the animal to keep it on its feet. Then he administers biologics, places ice on the head and uses copious amounts of water, introduced into the stomach and rectum through a stomach-tube.

Dr. J. F. McCabe, of Williamsburg, who has had a wide experience with the disease, gave it as his opinion that he could not have been dealing with the same virus as that which affected horses in southern Minnesota and northwestern Iowa, as the percentage of his recoveries had been much greater. He did think that possibly the coöperation of horse-owners had been better in eastern Iowa, where the veterinarians had been called to treat afflicted horses earlier.

Dr. C. B. Oldaker, of Kalona, echoed the advice of the previous speakers that horse-owners should not attempt to drench infected animals owing to the danger of producing mechanical pneumonia. The throat muscles are often paralyzed in encephalomyelitis. Dr. P. V. Neuzil, of Blairstown, condemned the stories which had appeared in newspapers regarding the use of

whiskey, and said that this treatment was both dangerous and useless.

Dr. H. B. Morris, of Keota, related his two-year experience with the disease in his territory. Dr. J. C. Glenn, of Norway, described his extensive experience with the disease recently, and commented favorably on the treatment described by Dr. Gerard. Dr. C. G. Moore, of Toledo, reported the use of blood transfusions with good success. Dr. H. M. Griffin, of Morning Sun, and Dr. John B. Gingery, of Muscatine, reported on the use of anti-hog cholera serum in lieu of anti-encephalomyelitis serum and normal horse serum.

Dr. C. E. Bassler, of Ainsworth, gave a very interesting talk on the 1912 enzootic in Kansas, and gave a differential diagnosis for corn stalk disease, botulism and encephalomyelitis. Dr. A. R. Menary, of Cedar Rapids, reported the successful use of the water treatment in the Omaha horse-market.

It was the consensus of the practitioners present that the symptoms of the disease vary greatly and that the treatment should be symptomatic in the absence of specific biologics. It is common sense to remedy the rapid dehydration of the body tissues, considering that an 1,800-pound horse loses 300 pounds in 24 hours. Stabled horses and those at work appear to contract the disease as gradually as those on pasture. The number of cases on a farm very often is only one, but one veterinarian reported as many as four fatalities on one farm.

Dr. H. A. Seidell, State Veterinarian, gave an authoritative discourse on equine encephalomyelitis in Iowa and described its ravages in the northwestern part of the state. He also made a plea that practitioners be on their guard against the introduction of anthrax from adjoining states. He reported that the disease had proven fatal to a man that day. Dr. Seidell warned against skinning carcasses of animals suspected of having died of anthrax and cited the state law which requires that such carcasses be given proper disposal within 24 hours.

Dr. R. M. Hofferd, of Cedar Rapids, read a paper on trichinosis and urged that practitioners consider the enormity of this disease and the possibility that it will cut down pork consumption if people realize how readily trichinae are passed from rats to hogs and from pork to human muscles. Dr. Hofferd would have all veterinarians remind their clients of the necessity for trapping rats on farms and completely destroying the rat carcasses as one means of reducing trichinosis among humans.

Dr. J. B. Bryant, of Mount Vernon, conducted a round-table discussion on practice problems. He called on Drs. F. E. Mon-

roe, of Phoebus, Va.; J. H. Krichel, of Keokuk; J. W. Griffith, of Cedar Rapids; John Weininger, of Des Moines; W. W. Bronson, of Wyoming, and Dr. Jerry Wolfe, of Grand Mound.

F. E. RUGGER, *Reporter*.

CEDAR VALLEY VETERINARY ASSOCIATION

The monthly dinner-meeting of the Cedar Valley Veterinary Association, held at Waterloo, Iowa, September 19, 1937, was attended by 47 veterinarians from 17 counties.

Dr. H. J. Shore, of Fort Dodge, gave a comprehensive talk on equine encephalomyelitis. He traced the history of the disease from the enzootic in the San Joaquin Valley, California, in 1930. He referred to the work of Drs. Haring and Meyer, of the University of California, and then traced the development of anti-encephalomyelitis serum and its use in California and Nevada the following year. By 1933, the disease had spread to Colorado and Wyoming, with a few reported cases in Utah. Dr. Shore then described the vaccine developed by the U. S. Bureau of Animal Industry, and stated that immunity resulting from vaccination develops more slowly, but is more lasting, than the immunity conferred by the serum. The march of the disease then was traced through Idaho and Montana in 1936. Dr. Shore then described the serum-vaccine treatment developed by Dr. Edward Records, of Nevada. The results following simultaneous vaccination have been variable, according to the reports made by different veterinarians.

Dr. L. H. Schwarte, of Iowa State College, discussed "Corn Stalk Disease of Horses." He covered the pathology of the disease and stated that it was not caused by a specific virus. It is usually most prevalent from November to May, after virus encephalomyelitis has subsided, but the two diseases may overlap in some sections. A number of practitioners present then related their experiences with the two diseases.

SOUTHWESTERN MINNESOTA VETERINARY MEDICAL ASSOCIATION

The semi-annual meeting of the Southwestern Minnesota Veterinary Medical Association was held in the Masonic Temple, in Luverne, September 21, 1937, with about 60 in attendance. Dr. C. J. Gillespie, of Heron Lake, presided. The address of welcome was given by the mayor.

The following program was given:

"Swine Diseases," by Dr. L. E. Willey, of Sioux City, Iowa.

"Principles Underlying Breeding," by Prof. L. M. Winters, of Saint Paul.

"The Practitioner in Disease Control," by W. W. J. Fretz, of Saint Paul.

Six new members were admitted to membership. A banquet was held following the meeting, with Dr. Gillespie acting as toastmaster.

L. E. STANTON, *Secretary*.

DISTRICT OF COLUMBIA VETERINARY MEDICAL ASSOCIATION

The first regular meeting of the District of Columbia Veterinary Medical Association for the 1937-38 season was held October 12, at the District Building, Washington, D. C., Dr. Mason Weadon presiding.

Dr. L. T. Giltner, of the Pathological Division, U. S. Bureau of Animal Industry, gave an interesting talk on "Equine Encephalomyelitis" and Dr. P. D. Harwood, of the Zoölogical Division, U. S. Bureau of Animal Industry, gave a paper on "Dog Ticks." Specimens of ticks commonly found along the eastern seaboard were exhibited to the audience. Interesting discussions followed these talks, which included the experiences of the Army, Bureau and practicing veterinarians relative to the control of equine encephalomyelitis.

W. M. M.

VETERINARY ASSOCIATION OF SASKATCHEWAN

The twenty-ninth annual meeting of the Veterinary Association of Saskatchewan was held at the University of Saskatchewan, Saskatoon, October 1, 1937. At the business session, the following officers were elected for the coming year: President, Dr. H. Richards, Indian Head; vice-president, Dr. A. Chambers, Regina; registrar, Dr. Norman Wright, Saskatoon; council: Drs. J. L. Millar, Asquith; M. Barker, Regina, and A. Richards, Indian Head.

After the business session, the question of the outbreak of equine encephalomyelitis in the province, and the measures adopted to control the disease were very thoroughly discussed.

Reports indicated that the horse-owners of the province were suffering a very serious loss. The supply of anti-encephalomyelitis serum was exhausted, with no prospect of any further supply this year. The farmers, in their fear of the disease, were willing to try anything, and unscrupulous persons were taking advantage of this fear in various parts of the province. It was reported that several thousand horses had been injected with various useless medicines, and with some that were worse than useless, at a cost of from 15 cents to a dollar a head.

The money loss from this useless treatment was not the only consideration, but the false sense of security that the farmers had, after the supposed treatment had been administered, was an important matter when measures were being considered to control the disease. The members at the meeting were of the opinion that in our present knowledge of the disease, antiserum in large doses was the only satisfactory preventive, but it was not so satisfactory as a curative agent, unless given very early in the disease and in quite large doses.

Dr. J. S. Fulton, of the Animal Diseases Laboratory, University of Saskatchewan, gave a paper on "Encephalomyelitis." He also gave an outline of the research work that had been done on this disease at the University during the past year. He stated that it was now definitely proven that the disease that was enzootic in Saskatchewan was encephalomyelitis and not botulism. He also stated that the disease was the western type.

NORMAN WRIGHT, *Registrar.*

NEW MEXICO VETERINARY MEDICAL ASSOCIATION

The fifth annual meeting of the New Mexico Veterinary Medical Association was held at Albuquerque, October 1-2, 1937.

At the business session, the Association voted to contribute \$15.00 toward the fund being raised for the A. V. M. A. to defray the cost of the educational exhibits at the San Francisco and New York fairs. It was decided to have a committee on public relations, and such a committee was appointed consisting of: Drs. W. L. Black, V. H. Magatagan and T. I. Means. Officers for the ensuing year elected were as follows: President, Dr. C. E. Freeman, of Carrizozo; vice-president, Dr. W. L. Hatcher, of Cimarron, and secretary-treasurer, Dr. T. I. Means, of Santa Fe.

A very interesting literary program was carried out. The first day, I. E. Newsom, Dean of the Veterinary Division of the

Colorado Agriculture College, spoke on "The General Problems of Sheep Diseases." Later in the day, Dr. Newsom spoke on "Urinary Calculi." On the second day, he addressed the meeting on the subject of "Encephalomyelitis." Other subjects discussed were the following:

"Mycotic Stomatitis and Its Relation to Other Like Diseases," by Dr. W. H. Hatcher, of Cimarron.

"Skin Diseases of Small Animals," by Dr. T. I. Means, of Santa Fe.

"Newer Therapeutic Agents that Recently Gained Prominence in the Veterinary Field," by Dr. A. G. Fisk, of Denver, Colo.

"Veterinary Inspection as Conducted in CCC Camps," by Capt. Thomas Evans, of Albuquerque.

"Synopsis of Bang's Disease and Malta Fever Eradication Work in New Mexico," by Dr. F. L. Schneider, of Albuquerque.

"Hospitalization of Small Animals," by Dr. Horst Schreck, of El Paso, Tex.

The banquet was served at the El Fidel Hotel the evening of the first day. Dr. C. E. Freeman acted as toastmaster. A clinic was held at the Veterinary Hospital of Dr. Magatagan. Entertainment was provided for the visiting ladies.

T. I. MEANS, *Secretary-Treasurer.*

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was held at the Hotel New Yorker, October 6, 1937.

President MacKellar introduced our guest and speaker, Dr. H. J. Baggs, biologist at Memorial Hospital, New York City. He gave us a very interesting talk on the various phases of cancer, pointing out that biopsies should be made of all tumors before being removed or treated, so as to determine the correct procedure for treatment. He explained the different types and ways by which a biopsy may be obtained and the treatment of tumors by x-ray. He stressed the important factor of proper restraint of the dog while under treatment, and the proper protection of the body of the patient with lead. He recommended for this purpose lead sheets 2 mm in thickness.

Larger doses of x-ray may be given over the region of the thorax than over the abdomen, according to Dr. Baggs. The amount of x-ray that can be given is determined by the dosage of x-ray that the skin will tolerate. He made a suggestion of 750 unit-R repeated doses given at intervals of one week until 3,000 unit-R have been given. There is no set rule to be fol-

lowed but the judgment and experience of the doctor is necessary for satisfactory results of the x-ray treatment of tumors. Further, he stated, one should not be alarmed at the increasing size of the tumor at the beginning of the treatment, as it will diminish later. Dr. Baggs gave the history of the treatment of tumors with radium and the progress which has been made in this field. Following his paper, an open discussion took place by Drs. Little, Garbutt, Zepp, Eichhorn, Buckingham and Chase.

We were further privileged to hear a talk by Dr. O. V. Brumley, Dean of the College of Veterinary Medicine, Ohio State University, and president of the A. V. M. A., on "Canine Filariasis." He handled the subject in a very able manner and gave us a complete history of the lifecycle of the Filaria, told how to make a diagnosis, and explained that this disease is probably more widespread in the United States than is generally believed. Dr. Brumley also recommended routine examination of the blood in any suspected cases. In regard to treatment, he advised the use of filsol or fuadin, which, he stated, were the best available products for the treatment at the present time.

A rising vote of thanks was given to our speakers, a motion was made to dispense with the business session, and the meeting adjourned.

J. B. ENGLE, *Secretary.*

EASTERN IOWA VETERINARY ASSOCIATION

The twenty-fourth annual meeting of the Eastern Iowa Veterinary Association was held at Hotel Montrose, Cedar Rapids, on October 12-13, 1937, with Dr. C. E. Hunt, of Mount Pleasant, presiding. Following the reading and adoption of the minutes of the 1936 annual meeting, the President gave his address. Then followed several committee reports.

The program for the first session consisted of the following subjects: "Making a Nation Meat-Conscious Through Education and Research," by R. C. Pollock, General Manager, National Live Stock and Meat Board, Chicago, Ill.; "Cyanogenetic Plants and Cyanogenesis," by Charles F. Rogers, University of Minnesota, Saint Paul, Minn.; "Animal Nutrition from the Veterinary Standpoint, with Calculations and Criticisms of Some Rations Used in Swine Feeding," by Dr. H. E. Biester, Iowa State College; "Deficiency Diseases in Cattle," by Dr. A. R. Stephenson, of Bennett; "Bovine Case Reports," by Dr. H. E. Tyner, of New London.

Dr. Frank Breed, of Lincoln, Neb., conducted the question-box during the meeting of the first day.

The program of the second session included the following discussions: "Sheep Practice in Iowa," by Dr. C. A. Anderson, of Centerville; "Observations in the Field of Swine Disease Control," by Dr. R. M. Hofferd, of Cedar Rapids; "Enteritis Caused by *Balantidium Coli*," by Dr. J. D. Ray, of Omaha, Neb.; "Just Something in Small-Animal Practice," by Dr. Earl R. Kennedy, of Moline, Ill.; "Ketosis of Cattle and Sheep," by Dr. Jesse Sampson, University of Illinois, Urbana, Ill.; "Case Report—Red Worms in Colts," by Dr. R. E. Elson, of Vinton; "Use of Sulfanilamide, Lentin, and Lang's Solution in Equine Practice," by Drs. Frank M. Wilson, of Mechanicsville, George T. Smith, of Reinbeck, and John B. Bryant, of Mount Vernon; "Equine Practice with Special Emphasis on Equine Encephalomyelitis," by Dr. Jas. Farquharson, Colorado State College, Fort Collins, Colo. Dr. L. A. Merillat, of Chicago, conducted the question-box at the close of the second session.

In the evening of the first day of the meeting, the annual banquet and ball was held. Dr. John B. Bryant was master of ceremonies. Dr. L. A. Merillat was the principal speaker and gave a stirring address pertaining to veterinary education. The total registration during the meeting was over 300. The ladies were provided with suitable entertainment.

The following officers were elected for the ensuing year: President, Dr. John J. Strandberg, of Belle Plaine; vice-president, Dr. John B. Gingery, of Muscatine; secretary, Dr. H. E. Tyner, of New London, and treasurer, Dr. S. G. Paul, of Clarence.

E. C. W. S.

INTERSTATE VETERINARY MEDICAL ASSOCIATION

The twenty-fourth annual meeting of the Interstate Veterinary Medical Association was convened at the Warrior Hotel, Sioux City, Iowa, October 14-15, 1937. The meeting was an outstanding success, with all attendance records broken. The registrations totaled 205, with seven states represented. Dr. C. H. Haggard, of Luverne, Minn., presided.

The program was arranged to cover prevalent infectious diseases of horses, cattle and swine, and a half-day was devoted to each of these species. Thursday afternoon, equine encephalomyelitis and related diseases were discussed. Dr. A. C. Starry, a

physician of Sioux City, presented "Sleeping Sickness in Man." Dr. James Farquharson, of Colorado State College, talked on equine encephalomyelitis and the so-called post-vaccination encephalitis which sometimes follows, in six to eight weeks, the use of anti-encephalomyelitis serum used as either a prophylactic or curative agent. His remarks were illustrated with some excellent motion-pictures of horses affected with encephalomyelitis.

Dr. C. H. Smith, of Fort Dodge, Ia., presented some interesting sidelights on the production of encephalomyelitis vaccine. Dr. L. H. Schwarte, of Iowa State College, reported on a non-virus encephalitis—"moldy corn poisoning," which had been reproduced experimentally during the last year. The Friday afternoon session was devoted to the bovine species with a very practical talk on "Nutritional Problems" presented by Prof. W. E. Peterson, of the University of Minnesota. Dr. James C. Carey, of West Liberty, Ia., read an excellent paper on "Cattle Practice." Dr. G. S. Weaver, of South Dakota Agricultural College, discussed "Anthrax Control."

Friday afternoon, Dr. Frank Breed, of Lincoln, Nebr., talked on "Swine Erysipelas," Dr. S. H. McNutt, of Iowa State College, on "Swine Pox," and Dr. H. E. Biester, of the same institution, gave a very thorough presentation of "Swine Nutritional Diseases."

Nearly 200 attended the banquet and dance, Thursday evening. A beautiful hand-made gavel was presented to the Association by Dr. Carl Viers, of Vermilion, S. Dak., who modestly explained that woodworking is his hobby.

Officers elected for 1938 were: Dr. E. R. Traux, of Sac City, Ia., president; Dr. S. S. Gibson, of Randolph, Nebr., vice-president, and Dr. W. A. Aitken, of Merrill, Ia., again re-elected secretary-treasurer.

The Ladies Auxiliary elected officers as follows: Mrs. A. A. Fosterman, of Utica, S. Dak., president; Mrs. S. S. Gibson, of Randolph, Nebr., vice-president; Mrs. H. E. Breckerbaumer, of Sioux City, secretary-treasurer, and Mrs. L. E. Willey, of Sioux City, corresponding secretary.

W. A. AITKEN, *Secretary.*

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION

The fifty-fifth annual meeting of the Pennsylvania State Veterinary Medical Association was held at the University of Pennsylvania Veterinary School, Philadelphia, October 21-22, 1937.

It was well attended, with more than 100 veterinarians present. Excellent facilities were provided by the local committee.

Addresses of welcome were given by Mr. Thomas Gates, president of the University of Pennsylvania; Dr. Alfred Stengel, vice-president in charge of medical affairs, and Dr. George A. Dick, dean of the Veterinary School. The response was given by Dr. Clarence J. Marshall, professor of veterinary medicine.

A splendid dinner was given in Pearson Hall, in the nature of a tribute to Dr. C. J. Marshall for his long service in the Pennsylvania State Veterinary Medical Association, as president, secretary and member of the Board of Trustees. His excellent service in the Veterinary Corps of the Army, and his long association with the teaching staff of the Veterinary School have endeared him to the hearts of all veterinarians who have come in contact with him. He was presented with an appropriate gift as a token of our affection.

The faculty of the Veterinary School conducted the clinics for large and small animals. Other veterinarians who participated in the program were: Dr. James M. Herron, of Bordentown, N. J., who gave some of his experiences in general practice; Dr. Howard W. Johnson, U. S. Bureau of Animal Industry, Beltsville, Md., and Dr. Ralph B. Little, Rockefeller Institute for Medical Research, Princeton, N. J., who brought out some very pertinent facts on mastitis. Lt. Col. Floyd C. Sager, V. C., U. S. Army, Front Royal Remount Depot, Front Royal, Va., thoroughly covered breeding problems in mares, the care of the mare prior to service and during pregnancy, and the care of the mare and foal. This paper was well discussed by Dr. John Gadd, of Towson, Md. Dr. Joseph P. Scott, research associate in the Veterinary School, presented a paper on "Swine Influenza." This was illustrated with specimens from an animal suffering from this disease.

Dr. William J. Lentz, of the Veterinary School, contributed a paper on "Diet and Nutrition of Small Animals," in which he demonstrated his general knowledge of this important subject. Dr. Otto Stader, of Ardmore, showed motion pictures of his method of applying his new splint in the treatment of fractures in small animals.

The following officers were elected for the ensuing year: President, Dr. Ernest W. Hogg, Wilkes-Barre; first vice-president, Dr. Henry P. Schneider, Spring House; second vice-president, Dr. William Boyd, Sewickley; third vice-president, Dr. C. P. Bishop, Lancaster; recording secretary, Dr. John D. Beck, Philadelphia; corresponding secretary, Dr. James F. Shigley, State College;

treasurer, Dr. William H. Ivens, Philadelphia; trustees, Dr. B. Scott Fritz, chairman, Marietta; Dr. C. J. Marshall, Philadelphia; Dr. H. R. Church, Harrisburg; Dr. H. B. Prothero, Johnstown, and Dr. Thomas D. James, Scranton.

ERNEST W. HOGG, *President.*

WASHINGTON STATE VETERINARY MEDICAL ASSOCIATION

The Washington State Veterinary Medical Association assembled in Yakima, October 23, 1937, and devoted almost the entire day to business matters. The meeting was well attended and was presided over by Dr. S. S. Worley, of Bellingham. A feature of the meeting was the dedication of the new hospital recently occupied by Dr. P. G. MacKintosh. This new institution, of modernistic design, has accommodations for both large and small animals and departments for every phase of veterinary hospitalization. Dr. MacKintosh visited Europe before building his hospital, which is believed to be the last word as far as facilities are concerned. It was a pleasure to participate in the dedication.

Progress made by the Association during the past year included the admission of 20 new members, an improved financial status, increased activities on the part of important committees, enforcement of the Veterinary Practice Act, dealing with regulatory incompatibilities, rabies control, meat inspection, and a general improvement in all branches of the profession.

Dr. C. E. Sawyer, of Puyallup, reported on Bang's control in a commercial dairy of 300 cows. He stated that over a five-year period the herd had been maintained as Bang's disease-free by testing all replacements made by purchases before admission to the herd and by periodic tests of the herd. The turnover was at a rate sufficient to replace the entire herd in five years. The owner of the herd was gratified at the success of the undertaking.

Dr. E. A. Rodier, of Pullman, reported on the organization of animal disease control in southwest China and related many interesting personal experiences. Dr. C. R. Forgher, a physician, and President of the Washington State Health Association, outlined the work of that group and acknowledged the place of the veterinarian in cooperating with their plans. Mr. Walter J. Robinson, Director of Agriculture; Dr. M. R. Hales and Dr. J. C. Exline participated in the general discussions.

Resolutions were presented and adopted.

1. Acknowledging the veto, by Governor Clarence D. Martin, of House Bill 396, affecting the Veterinary Practice Act.
2. Commending Mr. Walter J. Robinson and Dr. Robert Prior for issuing regulations for amending the Bang's disease control program; also expressing appreciation of state activities for the advancement of public health through the meat inspection service.
3. Restating general interest in the division of education funds in favor of the veterinary college at Pullman.
4. Extending appreciation to Dr. J. C. Exline and officials of the U. S. Bureau of Animal Industry for employing accredited veterinarians in disease control work, and petitioning the state and federal officials to consider the payment of indemnities on tuberculin tests made by accredited veterinarians in modified areas.
5. Memorializing representatives of Congress to adhere to the policy that all importations of animal products into the United States be subject to the same strict sanitary requirements that are imposed on our producers.
6. Supporting Dr. B. T. Simms, of Corvallis, Ore., for member of the Executive Board from District 7.

The election of officers for 1938 resulted as follows: President, Dr. C. E. Sawyer, of Pullayup; vice-president, Dr. R. R. Isham, of Auburn, and secretary-treasurer, Dr. V. C. Pahlman, of Chehalis.

The meeting closed with a very lively discussion of Bang's disease control.

V. C. PAUHLMAN, *Secretary-Treasurer.*

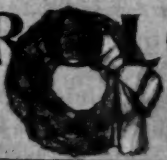
California Veterinary Conference

The California State Veterinary Medical Association, in coöperation with the University of California, will hold its annual conference at the University Farm, Davis, January 3-6, 1938. The conference is open, without charge, to all graduate veterinarians. Following is a partial list of the lecturers:

Dr. Oscar V. Brumley, president of the American Veterinary Medical Association and Professor of Veterinary Medicine, Ohio State University, Columbus, Ohio; Mr. Will A. Foster, Vice-President and Divisional Director of Sales, Borden's Dairy Delivery Company, San Francisco, Calif.; Dr. C. F. Schlotthauer, Department of Comparative and Animal Pathology, Mayo Foundation, Rochester, Minn.; Mr. Edward N. Wentworth, Director of Live Stock Bureau, Armour & Company, Chicago, Ill.

In addition to the above, the following members of the faculty of the University of California will participate in the program: Drs. Harold F. Blum, George H. Hart, Chauncey D. Leake, Karl F. Myer, W. W. Robbins and Milton I. Rose.

NECROLOGY



JOHN HOWARD BECKHAM

Dr. John H. Beckham, of Moundville, Ala., died in the U. S. Veterans Hospital, Atlanta, Ga., on August 29, 1937. He had been a patient in the hospital since May 9, suffering from leukemia.

Born on a farm near Moundville, October 14, 1895, Dr. Beckham received his early education at local schools. In 1913, he entered the Alabama Presbyterian College at Anniston. After attending two sessions at this institution, he decided to study veterinary medicine and entered the Alabama Polytechnic Institute. Following his graduation in 1919, he located in his home town of Moundville, where he conducted a general practice in conjunction with farming. Later he was in the employ of the Alabama Live Stock Sanitary Department on tuberculosis eradication. At the time of his death, he was in the employ of the U. S. Bureau of Animal Industry, engaged in Bang's disease control.

Dr. Beckham joined the A. V. M. A. in 1919. He was a member of the American Legion and members of his post were active pallbearers at the funeral. Honorary pallbearers were veterinarians of the federal and state forces with whom he had worked. He is survived by his widow, three daughters, three sisters and one brother, Dr. L. E. Beckham (A. P. I. '13), of Tuscaloosa, Ala.

L. E. B.

ARTHUR LOWELL EDMUNDS

Dr. Arthur L. Edmunds, of Franklin, N. H., died at his home on August 29, 1937. He had retired from active practice in March, 1934, because of poor health.

Born in Franklin, November 26, 1886, Dr. Edmunds received his early education in local schools and then attended Tilton Seminary and the Chicago Veterinary College. Following his graduation in 1907, he returned to Franklin and established a very large practice in that vicinity. He was state veterinarian

of New Hampshire for nine years. He served on the Franklin City Council from 1917 to 1919, and was municipal milk inspector for a number of years.

Dr. Edmunds joined the A. V. M. A. in 1915 and served as resident secretary for New Hampshire from 1928 to 1931. He was a member of the Twelfth International Veterinary Congress; the Meridian Lodge of Masons, Saint Omer Chapter; Royal Arch Masons, of Franklin; the Horace Chase Council, and Royal Selected Masters of Concord. He is survived by his widow (née Helen Dorman), two sons, two daughters and his mother.

C. L. M.

VIRGIL W. KNOWLES

Dr. Virgil W. Knowles, of Miami, Florida, died at his home, August 29, 1937, after a protracted illness.

Following his graduation from the Kansas City Veterinary College in 1907, Dr. Knowles was in the service of the U. S. Bureau of Animal Industry for about 15 years and was stationed at Oklahoma City, Okla.; Little Rock, Ark.; Livingston and Missoula, Mont., and Marshalltown, Iowa, at various times. In 1925, he resigned and entered practice in Florida, first at Miami, then at Hollywood and later at Okeechobee. In 1931, he returned to Miami and remained there until his death.

Dr. Knowles joined the A. V. M. A. in 1912. He is survived by two daughters and four brothers, of whom two are veterinarians, Dr. Adam T. Knowles (K. C. V. C. '04), of Miami, Fla., and Dr. A. D. Knowles (K. C. V. V. '06), of West Palm Beach, Fla.

FRED ALLEN SHEPHERD

Dr. Fred A. Shepherd died at his home in Belvidere, Ill., September 28, 1937, following an illness of four weeks. He had suffered a stroke several years previously.

Born at Fairmount, Ill., November 1, 1879, Dr. Shepherd attended local schools and then spent three years at the University of Illinois. He then decided to study veterinary medicine and entered the Chicago Veterinary College. He was graduated in 1904, and returned to Fairmount, where he conducted a general practice until eleven years ago, when he moved to Belvidere. He was Boone County Veterinarian for five years.

Dr. Shepherd joined the A. V. M. A. in 1919. He was a member of the Illinois State Veterinary Medical Association and the

Northwestern Illinois Veterinary Medical Association. He was a 32nd degree Mason, a member of the Shrine and Order of the Eastern Star. He is survived by his widow (née Leota Kidd) and four daughters.

QUINTUS COLTON FULLER

Dr. Q. C. Fuller, of Milford, Iowa, was killed on September 24, 1937, near Milford, when his automobile crashed into the rear of a moving State Highway Commission truck. He was en route to Storm Lake, Iowa, to visit two daughters who are students at Buena Vista College.

Born in Illinois, in 1867, Dr. Fuller studied veterinary medicine at Iowa State College. Following his graduation in 1890, he decided to study human medicine and entered Drake University. He received his M. D. in 1892. In 1912, he built the Milford Hospital and had operated it ever since. He is survived by his widow (née Opal Gillette), four daughters and three sons.

J. P. F.

G. LAMES

Dr. G. Lames died at his home in Dysart, Iowa, September 28, 1937. He had been in poor health for about five years and passed away following an acute illness of only a few days. He was in his 76th year.

Born at Le Claire, Iowa, Dr. Lames attended local schools and the Davenport Business College. In 1883, he went to Columbia, S. Dak., took a government land claim and lived there for six years. Then he decided to study veterinary medicine and entered the Chicago Veterinary College. Following his graduation in 1891, he returned to Le Claire and practiced there for about a year. In 1894, he removed to Dysart where he remained in practice until his death.

Dr. Lames joined the A. V. M. A. in 1902. He was a member of the Iowa Veterinary Medical Association and the Twelfth International Veterinary Congress. He had been a member of the Odd Fellows Lodge since 1886, was a member of Ascalon Lodge 393, Masonic order, and of the Consistory and Shrine at Cedar Rapids. He is survived by his widow (née Luella Stevena) and one son, Dr. H. S. Lames (Iowa '25), who was associated with his father in practice.

THOMAS WILLERTON

Dr. "Tom" Willerton, of Jacksonville, Ill., died in Passavant Hospital, September 30, 1937, after an illness of a few days. He was a graduate of the Ohio Veterinary College, of Cincinnati, class of 1893, and practiced in Jacksonville from 1893 until 1922, when he retired and sold his practice to Dr. C. A. Henley (O. S. U. '25). Surviving Dr. Willerton are his widow, one daughter and one son.

EDWIN W. BARTHOLD

Dr. Edwin W. Barthold, of Wichita, Kan., died at his home, October 15, 1937, following a cerebral hemorrhage. He was 69 years of age.

After entering the service of the U. S. Bureau of Animal Industry in 1899 as a tagger, Dr. Barthold resigned to study veterinary medicine. He received his veterinary degree from the Chicago Veterinary College in 1905, and then reentered the service as a veterinary inspector. He was assigned to meat inspection at Chicago, and subsequently was stationed at National Stock Yards, Ill., Fort Wayne, Ind., Austin, Minn., and Wichita, Kan. He was inspector-in-charge at Wichita when he was retired from the service, July 1, 1932.

Dr. Barthold was an associate member of the National Association of Bureau of Animal Industry Veterinarians. He is survived by his widow and one son.

MATTHEW BABER

Dr. Matthew Baber, of Roann, Ind., died in the Wabash County Hospital, at Wabash, Ind., October 29, 1937, as a result of an automobile accident north of Wabash on October 13.

Born near Roann, January 26, 1890, Dr. Baber was graduated from the Ontario Veterinary College, class of 1913, and his entire professional career was spent in Wabash County. He is survived by his widow (née Emma Shellinger), two daughters, one brother and three sisters.

F. C. T.

WILLIAM EDWARD ADAMS

Dr. William E. Adams, of Carson City, Mich., died at his home, November 7, 1937.

Born at Uxbridge, Ont., May 30, 1863, Dr. Adams located in Carson City shortly after his graduation from the Ontario Vet-

erinary College in 1893. He was in active practice until his retirement a few years ago. For 30 years he served as a member of the Board of Education and much of that time as secretary. He served on the Common Council for ten years and was very active in the Congregational Church. He helped to establish the Farmers and Merchants State Bank of Carson, City and served for a time as president.

Dr. Adams was a member of the Michigan State Veterinary Medical Association for a number of years. He is survived by his widow, one son and one daughter.

HERBERT FREDERICK LIENHARDT

Dr. Herbert F. Lienhardt, professor and head of the Department of Pathology, Kansas State College, Manhattan, Kansas, passed away after a lingering illness on November 11, 1937.



DR. H. F. LIENHARDT

Born May 21, 1894, in Wayne, Pa., Dr. Lienhardt attended local schools. He was graduated from the Radnor (Pa.) High School and then entered the University of Pennsylvania. He received his veterinary degree in 1916 and subsequently took graduate work at both the University of Pennsylvania and Kansas State College. In 1917, Dr. Lienhardt joined the staff of the Department of Bacteriology at Kansas State College and, two years later, was transferred to the Department of Pathology in the Division of Veterinary Medicine, with the rank of assistant professor. In 1920, he was made head of the Department with

the rank of full professor, which position he continued to hold up to the time of his death.

During the World War, Dr. Lienhardt saw service in the war zone in both France and Germany. On October 24, 1917, he was commissioned as second lieutenant in the Veterinary Corps. On June 10, 1918, he was directed to report at Camp Greenleaf, Ga., for a course of instruction. The following month, while enroute to the Veterinary Training School at Camp Lee, Va., he was assigned to Veterinary Hospital 12, A. E. F. He was discharged April 26, 1919.

Dr. Lienhardt joined the A. V. M. A. in 1916. He was a member of the Committee on Prevention of Transmissible Diseases of Animals, 1928-29, and a member of the Committee on Education, 1931-36. He was a member of the Twelfth International Veterinary Congress, the Kansas Veterinary Medical Association, the American Association for the Advancement of Science, Gamma Sigma Delta, Phi Kappa Phi, Sigma Xi, and the Kansas State College Wranglers Club. He was a member and past president of the Manhattan Coöperative Club, a Mason and was actively identified with the Presbyterian Church.

In addition to his ability as a teacher, Dr. Lienhardt was an indefatigable research worker in animal diseases, and he has to his credit many original publications. He was beloved by his associates, the student body, and a large circle of friends. His passing is mourned by his widow, three daughters and one sister.

R. R. D.

Our sympathy goes out to the family of Dr. A. M. Drudge, of Bremen, Ind., in the death of their daughter recently.

Buffalo Herd Dispersed

According to *The Cattleman*, a herd of 80 buffalo, which were once a part of the famous 101 Wild West Ranch Show, was marketed recently. Fifty bulls and heifers were purchased by an Ohio packer who plans to conduct feeding experiments with some of the animals. The remaining 30 head were purchased by a Colorado rancher.

No Race Suicide Here

Eleven days after a Holstein cow had given birth to sextuplet calves, near Clarksburg, W. Va., a sow farrowed 20 pigs on a farm near Elberton, Ga. The six calves were reported to be alive nine days after they were born.

PERSONALS

MARRIAGES

DR. SOL G. STEPHAN (O. S. U. '36), to Miss Tecla Berling, both of Cincinnati, Ohio, in that city, November 6, 1937.

DR. HUBERT O. MOORE (Ind. '07), of Hattiesburg, Miss., to Miss Ethel Baylis, of Eatonville, Miss., at Hattiesburg, November 3, 1937.

DR. R. J. HENSHAW (Mich. '37), of Detroit, Mich., to Miss Charlotte Thatcher, in September.

MR. ROBERT LOWRY to Dr. Josephine Von Eberstein (Mich. '37), both of East Lansing, Mich.

PERSONALS

DR. C. E. BILD (Iowa '33) has removed from Miami, Fla., to Hallandale, same state.

DR. WILLIAM H. LINDLEY (K. S. C. '33), of Vicksburg, Miss., has gone to Leland, same state.

DR. R. G. CHAPMAN (Ont. '26), formerly of Moose Jaw, Sask., is now located in Toronto, Ont.

DR. JAMES F. HERR (Wash. '30) has changed location from Woodland, Calif., to Monterey, same state.

DR. EMILIO L. LUACES (K. C. V. C. '08) is a member of the Cuban Congress from Camaguey Province.

DR. W. F. HALL (McK. '11) reports a change of address from Anadarko, Okla., to Okmulgee, Okla.

DR. J. J. SOLT (O. S. U. '36), formerly of Arlington, Ohio, has opened an office in Upper Sandusky, Ohio.

DR. C. J. HOOK (K. S. C. '35) has entered practice at Wooster, Ohio. His office is located at 731 W. Liberty Street.

DR. HUGH L. DIXON (Ont. '10) has changed his address from Gov-enlock, Sask., to Shaunavern, same province.

DR. ROBERT R. SHOMER (U. P. '35) has opened a hospital for small animals at 1680 Teaneck Road, Teaneck, N. J.

DR. CARL C. TUCKER (O. S. U. '35), who has been practicing at Warsaw, Ind., has removed to Wabash, same state.

DR. G. F. BABB (K. C. V. C. '10) was retired from active service in the U. S. Bureau of Animal Industry on September 30.

DR. GEORGE SHEETS (O. S. U. '28), formerly of South Charleston, Ohio, has located in Urbana, Ohio, for general practice.

DR. N. S. MAYO (Chi. '89), of Highland Park, Ill., accompanied by Mrs. Mayo, has gone to Mount Dora, Fla., for the winter.

DR. S. FRANK LOFFER (K. C. V. C. '06) reports a change of address from Huntington Park, Calif., to Long Beach, same state.

DR. C. H. MERRICK (Chi. '93), of Okawville, Ill., has retired from active practice on account of ill health and advancing years.

DR. G. A. HANDLEY (Chi. '04), has sold his property at Eaton, Ohio, and has bought a new property at Washington Court House, Ohio.

DR. L. H. BEEBE (K. S. C. '30) resigned from the U. S. B. A. I. service on October 15 and returned to his practice at Warrensburg, Mo.

DR. F. D. C. MARKHAM (Corn. '35), of Catskill, N. Y., has entered into a partnership with Dr. N. D. Backus (Corn. '05), of Elyria, Ohio.

DR. F. M. WILSON (Chi. '11), of Mechanicsville, Iowa, is now occupying a new suite of offices in the first floor of his two-story brick bank building.

DR. H. P. WESSELS (Iowa '36), formerly of Buffalo Center, Iowa, has formed a partnership with Dr. A. G. Gieske (Chi. '06), of Barrington, Ill.

DR. S. W. LANGE (Mich. '35), has left East Lansing, Mich., and is now with the Division of Health, Department of Public Welfare, Saint Louis, Mo.

DR. A. H. KLEINFELD (Corn. '31) has just completed the erection of a modern hospital for small animals at 4470 Hudson Boulevard, Union City, N. J.

DR. E. A. MILLER (Ind. '20), formerly in practice at Rosedale, Ind., has located in Ladoga, Ind., taking over the practice of the late Dr. C. C. Harting.

DR. WM. S. BRITTON (Mich. '36) resigned from the service of the U. S. Bureau of Animal Industry on October 15, with a view to entering the field of practice.

DR. J. G. JERVIS (Ont. '12), of Milner, B. C., has presented to the library of the University of British Columbia his complete file of the JOURNAL of the A. V. M. A.

DR. P. G. MACKINTOSH (McK. '16), of Yakima, Wash., is now located in his new hospital which is equipped with complete facilities for both large and small animals.

DR. S. N. BLACKBERG (Corn. '18) has severed his connection with the Columbia University College of Physicians and Surgeons and is now located in Little Rock, Ark.

DR. LESTER R. BARTO (U. P. '30), formerly associated with Dr. J. B. Engle (Corn. '26), of Summit, N. J., has entered practice on his own account at Basking Ridge, N. J.

DR. J. L. WARD (O. S. U. '35), who has been in the employ of the U. S. Bureau of Animal Industry, has opened an office in Mansfield, Ohio, where he will conduct a general practice.

DR. C. B. KRONE (K. S. C. '26), who has been in general practice at Concordia, Kan., for a number of years, has removed to La Grange, Ill., where he is building a hospital for small animals.

DR. EDD E. RASH (Iowa '34) has resigned from the service of the U. S. Bureau of Animal Industry and has entered into a partnership with Dr. W. L. Evers (West. '00), of Iowa Falls, Iowa.

DR. N. A. KIPPEN (Ont. '97), of Independence, Iowa, spent a week in September at Prairie du Chien, Wis., taking the baths. He sought relief from a nervous affliction which disabled his left arm.

DR. FRANK B. WILKINSON (Iowa '36), who has been stationed in Austin, Minn., on meat inspection work, is now at the Texas A. and M. College, Department of Veterinary Medicine and Surgery.

DR. C. B. STRAIN (McK. '13), of Dunkerton, Iowa, spent a week in the hospital at Iowa City, in September, for observation and treatment of a severe skin eruption attributed to metallic poisoning.

DR. JAMES M. MURPHY (U. P. '35), formerly research associate in milk hygiene at the University of Pennsylvania Veterinary School, is now at the New Jersey Experiment Station at Sussex, N. J.

DR. J. L. BOYDSTON (Mich. '37) has removed from Sturgis, Mich., to Athens, Mich., where he has taken over the practice of the late Dr. W. L. Scofield. For the time being, Dr. Boydston will continue to hold the position of City Meat and Milk Inspector for Sturgis.

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formation of fibrous tissue. In the skeleton we have favorable conditions—bone reproduces bone. Capsular tissue reproduces itself in fibrous new growth, and even the endothelial joint layer is reproduced. Ideally we may have perfect repair. In fact such a repair occurs in dislocations, not uncommonly, and in fractures when there has been no malposition. In practice there is apt to be either absence or else restriction of motion from over-repair of dislocations and over-growth of bone in the callous that welds together separated fragments in fractures. Some temporary over-growth, or callous, is almost always present and extreme cases are not rare.

The conditions favoring callous formation and bone growth are imperfectly understood, but we may formulate the following rules: The primary callous is dependent for its mass on the primary blood clot and the cellular infiltration of the surrounding tissues. The ossification of the fracture, starting in the primary callous, proceeds in the main from the inner side of the periosteum, which is stripped off more or less extensively. The outer side of the periosteum seems to take no part as a starting-point of ossification. It furnishes no osteoblastic cells. Callouses may unwrap muscles or tendons, but they are not a part of the bone-forming repair. Callous formation, between bone ends and the internal callous arising from the marrow, has a part to play later; but it has little to do with the bone formation in the provisional consolidation, which is what we know clinically as firm union.

The merging of tissue into real bone union is a long process and does occur, but that is long after the case has been discharged as cured.

Parallel bone formation also does occur, with the restoration of the marrow cavity, but I can not advance a theory as to why, or how, bone reabsorption does or will take place. I shall endeavor to show one of these so-called parallel bone healing formations that took place after a lapse of fifty days. In most cases all that concerns the practitioner in fractures is such as permits motion without pain. We also seek a union sufficiently firm to permit the use of the limb without danger. It is surprising to learn how early in some patients this process of repair reaches that end. Bone possesses, as do the other supporting tissues, a large proportion of intercellular substances. The diaphysis of a long bone consists of compact bone substance, while the ends of the epiphyses are composed of more spongy



FIG. 4. Fracture of tibia.

bone. Beneath the cortical shell of compact bone are canal spaces and haversian canals, in which blood-vessels lie. Between and around these canals are smaller connecting spaces, lacunae containing bone cells. Around the haversian canals the bone lacunae are arranged in concentric rows. From the fibrous periosteal covering, connective tissues enters the bone on all sides.

Bones considered as organs are made up of bony tissue, periosteum and central bone marrow. The latter consists of blood-vessels and nerves supplying the different parts of the bone. The periosteum has an outer fibrous layer containing nerve plexuses and blood-vessels, and an inner, delicate, less vascular layer, rich in connective tissue cells. In the inner layer of the periosteum lie cuboidal cells, osteoblasts, which play an important part in the development and regeneration of bone. Throughout the cavity of the long bones is a space filled with the bone marrow which enters the haversian canals. The bone periosteum and the bone marrow are supplied with blood-vessels; these enter the periosteum, supplying largely the outer lamellae of the cortical bone. The blood-vessels of the marrow arise from the nutrient artery of the bone. There is an intimate capillary anastomosis between all the vessels.

NON-UNION OF BONE

Non-union usually means delayed union and many times destruction of the patient. The reasons for delayed union are many. To enumerate: improper reduction, badly fitting splints, rachitis, anemia, distemper, old age, lack of calcium, or deficiency of inorganic bone-forming elements of the blood, many times lack of proper diet, due to the lack of proper phosphorus content. These are the theories that I advance. To prevent non-union in the treatment of every fractured bone it is very important that the surgeon should carefully safeguard the care and treatment of the patient, that he may preclude the possibility of any deviation from the normal healing. Therefore, I say once more that animals with fractures should be under the care of the veterinarian until a firm union has been established. First of all, it is the doctor's duty to see that the immobilization of the parts is satisfactory, so that there is a minimum amount of motion at the seat of fracture; second, that the circulation of the parts is good; third, that the fracture is well reduced; and fourth, that you know that it is well



FIG. 5. Luxation of femur from acetabulum.

reduced, and that you may have the proof of such with an X-ray picture, not only in one, but in two plates, and in serious fractures plates may be taken every ten days, in order to show exactly what is taking place. I can recall at this time but very few cases that have left our hospital where union had not taken place; however, I do recall some cases in fractured femurs that were taken out before they were in shape to leave.

SPONTANEOUS FRACTURES

From my own observations upon rachitis in puppies, I can say that fractures do occur spontaneously in the femur, tibia and fibula of young dogs. I give a case report of a litter of four Italian wolfhounds. These puppies were born late in September, reared under very favorable conditions, under good sanitary conditions, but were not allowed to get upon the ground; they had the best of feed and excellent care generally. At two months of age a streptococcus infection entered their lives; treatment was given with apparent immediate results. However, at eighty days from the time these puppies were born, one of the puppies became lame behind. Upon examination I found a fracture of the distal end of the femur, and upon further examining the shaft of the femur, unfortunately I fractured the proximal end of the bone. This was the first puppy down; he was destroyed. One week later the two puppies were brought into the clinic, all showing the same symptoms. These two puppies also were destroyed. The fourth puppy was placed in a riding academy and has never had a sick day. I will show you the bones of these three puppies for your own observations. I wish to state that all these puppies had vast quantities of cod-liver oil, and were given the quartz-light treatment daily for ten days, after which time no apparent results were obtained, and the puppies were destroyed.

CONCLUSIONS

It appears to me that the time is right for the veterinary profession, more especially the small-animal practitioner, to focus his thoughts on better and more modern methods of diagnosing ailments of the small animals, and in saying this I have reference to the X-ray machine. Basing my opinion upon four years of personal observation in constant contact with this machine, also the great store of valuable observations that one may receive and record in his daily work. I place the X-ray at the top of the list in any well-equipped veterinary hospital for the

great value one may receive from it; also as a practice-builder there is nothing to compare with it. I furthermore feel that we are fortunate today in not only having the X-ray as an accessory method of diagnosis, but in having, as a result of this diagnostic method, a vast array of observations made directly at operations and material for deductions, not accessible to a previous generation. Wisdom did not begin with this generation, but we have an unusual opportunity at the present time to learn. It is with this same spirit that I quote from Dr. Charles Locke Scudder's *Treatment of Fractures*.

REFERENCES

- Cotton, F. J.: Dislocations and Joint Fractures (2nd ed.; W. B. Saunders Co., Philadelphia, 1924), pp. 1-745.
Frost, G. P.: The X-ray in canine practice. Jour. A. V. M. A., lxii (1922), n. s. 15 (2), pp. 197-199.
Griessman, L.: Further studies in X-ray diagnosis in veterinary medicine. Jour. A. V. M. A. xlix (1916), n. s. 2 (6), pp. 830-831.
Hamilton, H. M.: The X-ray as diagnostic agent in the horse. Jour. A. V. M. A., lviii (1921), n. s. 11 (6), pp. 717-718.
Horning, J. G.: The X-ray and small animal practice. Jour. A. V. M. A., lxxi (1927), n. s. 24 (2), pp. 210-211.
Kingman, H. E.: The use of X-ray in veterinary medicine. Amer. Vet. Rev., lxvii (1915), pp. 598-605.
Krumbhaar, E. B., & Tucker, G.: Successful removal of obstructing bone from a dog's esophagus by means of the esophagoscope. Jour. A. V. M. A., lxx (1926), n. s. 23 (3), pp. 379-382.
Scudder, C. L.: The Treatment of Fractures (10th ed.; W. B. Saunders Co., Philadelphia, 1926), pp. 1-1240.
United States Army X-Ray Manual (Paul B. Hoeber, New York, 1925), pp. 1-506.

ON THE WAY TO MINNEAPOLIS



The Oriental Limited in the Cascades of Washington.

TREATING FEMUR AND PELVIC FRACTURES

By A. J. STEINER, Lexington, Ky.

It was the writer's pleasure to hear the papers on fractures presented by Drs. Zepp and Patterson at the 1927 A. V. M. A. meeting, but on account of adjournment following their presentation it was not his privilege to enter into discussion. It seemed that both papers stressed the writers' inability to set femur fractures, as most cases reported were destroyed. Inasmuch as I have had remarkable success in treating such fractures, I feel that a brief description of the methods used may prove beneficial to my fellow practitioners, and at the same time prevent unnecessary destruction.

In the last three years about forty cases have been treated and, to my knowledge, only two of these were later destroyed. Both of the latter were distal-end fractures. In three of the cases both femurs were fractured, and in a number of others the pelvis also was fractured. While it has not been possible to check up on all these cases, only a few of those later observed showed any resulting lameness, and that usually from a slightly shortened leg, but not objectionable to the owner. A brief description of my first and later most interesting case will demonstrate what can be accomplished in femur and pelvic fractures.

On June 16, 1924, a six-months-old Airedale with a broken leg was presented for treatment. Examination revealed a complete oblique fracture about 2-3 inches below the head of the femur. Rectal examination disclosed complete fractures of the acetabular branches of both the pelvis and ischium. Being unable to meet the situation, I called in consultation a physician who is a recognized bone specialist in this city. With his assistance an unique plaster cast was applied, but an X-ray picture proved its fallacy and it was removed. After a number of suggestions on his part, a feasible method of treatment was decided upon. (Method, somewhat modified, is described later.) The animal was kept in a semi-suspended position for seven days at no apparent discomfort and then taken down and allowed the freedom of its kennel. For several days the hind legs were practically paralyzed from muscular fatigue and disuse. The animal soon gained use of its uninjured leg and got around nicely on its three good legs.

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At this stage the animal was dismissed from the hospital and not observed again for several months, when carriage and gate were perfectly normal. A slight enlargement of the femur at the point of fracture remained.

On January 15, 1925, the same dog returned with complete transverse fractures in the middle third of each femur. It was again placed in an arrangement, as previously used, for ten days, when all restraint was removed. In two days the dog was dismissed with instructions to let the animal lie quietly until ready to use its legs of its own accord. The owner reported in two weeks that the animal was using the hind legs some and was gradually getting stronger on them. About three months later the writer saw the dog running on the street with no lameness evident. About a year after the last injury, the dog was in the hospital and examined closely. The legs were normal except for a slight thickening of the bones at each fracture.

DESCRIPTION OF AUTHOR'S METHOD

The method used for setting the fractures in the case described above is a modification of that occasionally used on humans. It consisted of partially suspending the animal by its hind legs in a sling-like arrangement made as follows: A piece of board (cigar box) about two inches square is placed midway on a strip of adhesive tape 2 inches wide by about 30 inches long, the length depending on the size of the dog. A small hole is bored through both board and tape. Two such pieces are needed—one for each leg. The wooden block is used to prevent pressure of the tape against the foot. The adhesive is then heated and with the board held about one inch beyond the foot, the adhesives are plastered along the lateral and medial surfaces of the leg. In long-haired dogs it is advisable to clip the hair from the legs first. The adhesive should extend from the foot to the stifle on the injured leg and may extend to the back on the uninjured leg. Small half-inch strips of adhesive are run loosely around the leg above and below the hock to hold the underlying tape in place. A gauze bandage is then loosely wrapped around to protect the adhesives. The same procedure is followed on the other hind leg, regardless of whether it is injured or not. A small sash-cord or heavy braided twine is then passed through the hole in the board and knotted on the side nearest the foot, so that it cannot come through. The dog is then placed on its back in a well-bedded kennel and the ropes are passed through two small

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pulleys which are attached to the top of the kennel. These pulleys are placed a little farther apart than the natural distance between the legs. The ropes are pulled up until the dog's hips are barely off the floor. Unless both legs are broken the foot of the injured leg should extend up about an inch higher than the uninjured leg. The two ropes are then knotted together on the far side of the pulleys so that the hind legs will remain fully extended. The free end of one rope is then run through a third pulley farther back and a weight sufficient to take up any slackening of the rope caused by the movements of the animal is applied. These ropes occasionally have to be readjusted.

The traction on the legs soon causes muscular fatigue and the broken bones are brought into as perfect apposition as possible by the stretching and pressure of the muscles. It is advisable to examine the leg at the end of the first day to see that the bones are properly set. In some cases it is necessary to tie the head of the animal to the opposite end of the kennel so that it can not get to the bandages or work itself around its hind legs. This is usually removed, however, after the first or second day and the dog is allowed to assume any position it wants. The ropes may have to be untwisted occasionally.

FEW DOGS OBJECT TO TREATMENT

At first thought one would not believe that a dog would tolerate such confinement, and it is surprising how complacently they take it. In my experience only two have objected strenuously and they were both young fox hounds.

The fractured bone apparently knits together in five to ten days, depending on the nature of the fracture and the age of the dog, and with the care that a dog takes of an injured leg it will continue to heal properly after the animal is set free.

The other method used that will give good results in certain cases is the cast; however, it does not always give the results obtained from the previously described method. This treatment is used particularly on certain transverse fractures, especially of small dogs. No attempt is made to set the leg until 24 to 36 hours following injury, so that the swelling will have reached its limit and will not cause unnecessary removal of the cast later. The animal is suspended at a convenient height by tying ropes from its legs over a board the width of the animal's body. An assistant holds up the head and keeps the dog from struggling. A single piece of heavy cardboard is then placed

under the hips and bent up along the legs, leaving a half-inch space between the back and the board. Trace on it the outline of the legs and cut, allowing for slightly more flexion in the hocks. The cardboard can be made to conform to the hips and rump by cutting out the fullness and applying adhesive to hold it in shape. A piece of strong steel wire, $\frac{3}{16}$ or $\frac{1}{4}$ inch in diameter, is bent and shaped to go around outside of the board and is attached with adhesive. A piece of board is then cut to conform to the medial surface of the injured leg, and is also reinforced with wire. By the time the cast is prepared, the muscles of the leg have fatigued so much that the bone can easily be set. Cotton is placed under the case and bandages are applied, starting at the hocks. Before bandaging around the hips, the cast is pushed forward as far as possible and adhesive strips are placed from it to the body to hold it in place. It is then bandaged completely by running the bandage around the abdomen and between the legs. The hocks are then slightly flexed, so that they can not recede into the cast, and bandaged. When the entire cast is tightly bandaged, plaster of Paris bandages are applied and allowed to dry. The dog is then taken down and placed in a kennel where it usually sits on its rump or lies recumbent for a day or so, when it realizes that it can stand on the casted legs and hobbles about. At this time it is imperative that you watch the abdomen in front of the cast, so that pressure necrosis does not take place. If the animal has a tendency to chew at the cast, a wrapping of bicycle tape will frequently prevent it. The cast is left on from one to two weeks, or until it is too loose to be of any service.

VETERINARY SANITARIANS APPOINTED

Mr. W. G. Campbell, Director of Regulatory Work, Food, Drug and Insecticide Administration, U. S. Department of Agriculture, announces the following appointments of veterinary sanitarians in connection with the enforcement of the Federal Import Milk Act. Announcement of civil service examinations for these positions was made in the January issue of the JOURNAL.

Dr. George Smith, Jr., of Toledo, Ohio, has been appointed as an Assistant Veterinary Sanitarian. Drs. Fred W. Graves, of Wolcott, Ind., Chas. W. Gates, of Chicago, Ill., Harry P. Stout, of Zeigler, Ill., and Murray J. Dills, of Decatur, Ill., have been appointed as Junior Veterinary Sanitarians, all for duty at the Rouses Point (N. Y.) Station.

THE EXAMINATION OF FECES FOR EVIDENCES OF PARASITISM*

By B. M. UNDERHILL, *Philadelphia, Pa.*

School of Veterinary Medicine, University of Pennsylvania

If there is reason to suspect that an animal is harboring parasites at all, there will then be brought to mind several first-line considerations, as to which may be mentioned specific susceptibility, exposure, age, environmental habit, diet, physical condition, and symptoms. The value of such diagnostic factors will, as in other evidence, be proportionate to the diagnostician's knowledge of the parasites with which he has to deal. Knowing in detail the biology of the common parasites of his animal, they will contribute to the conclusion, not only as to the presence of the parasites, but as to their kind and location as well. For diagnosis of roundworm and usual flatworm parasitism of the alimentary tract, we are fortunately not confined to the rather atypical symptomatic evidence.

Gross examination of alimentary discharges, as feces or vomit, may reveal complete or fragmented parasites, though here, as in other such evidence, if there are at the same time anemic and general malnutritional indications in the host, we should guard against too hasty conclusion as to cause and effect. Often animals in such condition are harboring parasites as a coincident contribution to faults which must be looked for elsewhere. Needless to say, however, the animal in any case should be relieved of its parasitic burden, whether heavy or light, as one of the first considerations toward its improvement or recovery.

Relative to the results obtained in fecal examination for parasitic eggs, it is a matter of interest that we are aided in this by the biologic phenomenon of adaptive modification. It is true as to the parasitic habit in general that it involves a hazard in the perpetuation of the parasitic species, the degree of which will be greater or less according to the phylogenetically acquired dependence upon a host and mode of propagation. Relative to this there is a compensatory development of the reproduction function involving the production of an enormous number of eggs, of which only an infinitesimal number can reach such transmission as will make possible a new generation.

*Presented at the University of Pennsylvania Conference for Veterinarians, Philadelphia, January 4-5, 1928.

The daily egg production of several species of parasitic worms has been estimated by a comparison of the number of worms obtained by treatment with the egg output as determined by the dilution egg count (Brown and Cort, *Journal of Parasitology*, December, 1927). By this method Stoll (1923) obtained about 9000 eggs per day for a female of *Necator americanus*, the American human hookworm. Cram (1925) has estimated that a single female of *Ascaris lumbricoides* may contain as high as 27,000,000 eggs. Brown and Cort report the case of a five-year-old boy who was found to be passing in fecal output for a single day approximately 10,064,000 ascaris eggs. After treatment seventy-seven ascarids were obtained, forty-three of which were female, giving about 234,000 eggs per day for each female.

Numerous methods of preparation of fecal material for the microscopic detection of parasitic eggs have been described, some requiring a considerable array of apparatus and laboratory equipment. The process which I have chosen to demonstrate to you is one of several based upon relative specific gravity of eggs to dilution in which they are contained, either of which can be quickly carried out with but few utensils. In my own experience I have obtained quite satisfactory results with the concentrated sugar solution method which first came to my attention by way of a reprint of an article upon the diagnosis of intestinal parasites by Dr. E. A. Benbrook, professor of pathology at Iowa State College. Dr. Benbrook states that the method was originated by Dr. A. L. Sheather, assistant director, Research Institute in Animal Pathology, Royal Veterinary College, London.

In the demonstration of the process you will note the very few utensils required and the rapidity with which it may be carried out. The sample of feces should be of generous size, for the dog, up to as much as can be heaped upon a tablespoon according to size of animal and material available. For the horse and sheep there should be at least as much as will half fill a quart Mason jar. Sufficient water is added to the sample to make a thinly fluid mixture in which the harder particles are broken up and well stirred. Formed and lumpy dog feces should have about three parts of water added to one of feces, horse feces equal parts, and sheep pellets about three parts of water to one. To remove the coarse material the mixture is strained through an ordinary flour-sifter, with a mesh of about thirty per inch. The fluid obtained is now poured into several ordinary test-tubes or centrifuge-tubes, up to about one-third of their capacity,

and to each of the tubes there is added an equal amount of the following solution: granulated sugar one pound, water twelve ounces. This stock solution may be made by up immersing the vessel (unstoppered) in hot water, adding phenol or formol one per cent as preservative. After adding this solution, gently mix it with the fecal fluid by slowly inverting each tube several times. The tubes should now be allowed to stand without being disturbed for eight to twelve hours, or, if a centrifuge is available, they may be centrifuged for a few minutes at about 1500 revolutions per minute.

While standing, the eggs, being lighter than the fluid, will concentrate at the top, from which they may be transferred to a microscopic slide by touching the surface with a glass rod or the finger tip. The slide, with or without cover-slip, is now placed upon the stage with microscope tube in vertical position. Low-power objective should first be used and too high an illumination avoided, as this will obscure detail.

Though it is stated that the tubes containing the prepared material, if not centrifuged, should stand for eight to twelve hours or more, I have obtained by this method numerous *Strongylus* eggs from horse feces within three hours after receiving the samples. In any case, and especially in small-animal work, it is well to inquire whether oil has been recently given previous to securing the fecal sample. Oily feces will prevent satisfactory results in that the oil will rise to the top and interfere with the collection of the eggs upon the surface. Several fluid agents other than sugar solution are in use for the purpose of rapid parasitic diagnosis; these include glycerin and saturated watery solutions of calcium chlorid or sodium chlorid. The process with either of these is, of course, based upon the same principle, that of relative specific gravity, and they may be carried out with the same utensils and by the same simple procedure as here demonstrated.

DOCTOR MAYO ADDRESSES INSPECTORS

Dr. N. S. Mayo, of North Chicago, Ill., addressed the meeting of the Veterinary Inspectors, held at the Union Stock Yards, Chicago, on June 11. The subject of his talk was "The Veterinary Profession at the Present Time and the Probable Future Trend." Dr. Mayo emphasized the important part that the A. V. M. A. has played in the development of the past and urged the Bureau men to join the Association and give it their active support.

THE EPIZOOLOGY OF BOVINE COCCIDIOSIS

By LEE M. RODERICK, *Fargo, North Dakota*

North Dakota Agricultural Experiment Station

Reports of the "bloody diarrhea" in young cattle which come to our attention are almost pathognomonic for intestinal coccidiosis. Further inquiry invariably reveals that the characteristic symptoms and course of the disease exist in the affected animals. Moreover, the fecal examinations regularly confirm such tentative diagnoses by the finding of the oöcysts of the parasitic protozoa.

Occurrence: Bovine coccidiosis, or "red diarrhea," is cosmopolitan in its distribution. The reviews of Knuth and du Toit¹ and of Railliet² refer to many European and African studies. The 6th German edition of Hutya and Marek³ and the English translation thereof specifically state that the disease occurs almost exclusively during the summer months (June to September) and particularly in wet years. Most of the animals commonly become infected on pasture and especially in mountainous areas while rarely in the lowlands. This applies no doubt to conditions in Switzerland where the studies were made and where the disease was epizootic. It was recognized a few years ago, when the extent of the disease had attained serious proportions, that a different situation prevailed in North Dakota. The purpose of this paper is to contrast the influences here which may govern the occurrence of the disease with those reported elsewhere.

The disease has been reported by several observers in various localities in North America, including Schultz,⁴ in Washington; Marsh⁵ and Welch, in Montana; Smith and Graybill,⁶ in New Jersey; Dykstra,⁷ Muldoon⁸ and Frank,⁹ in Kansas; Lentz,¹⁰ Barnes and Brueckner,¹¹ in Pennsylvania; Bruce,¹² in British Columbia; Gwatkin,¹³ in Ontario; and Way and Hagan,¹⁴ in New York. A number of reports refer to sporadic appearances of the disease and do not suggest that a serious situation was involved. The disease attained epizootic proportions in Montana, Washington, Kansas and British Columbia. Furthermore, the Montana, New York and British Columbia reports involved an occurrence in winter. The conditions of temperature and humidity are quite similar for the occurrence of the disease in Montana, British Columbia and North Dakota, while abundant moisture probably was not concerned in Kansas.

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The information which has come to our attention from year to year from veterinarians and farmers of the State indicates that the disease is now enzootic. It appears to have prevailed more or less extensively during the last eight years in parts of North Dakota. While most of the deductions outlined in this paper are drawn from conditions in North Dakota, it is believed from available information that many of the statements are likewise applicable to the adjacent parts of South Dakota, Montana, Saskatchewan and Alberta, as well as for North Dakota. Obviously, the frequency of the disease varies from year to year in different localities as well as its seasonal occurrence. Moreover, it is well recognized that most morbidity and mortality statistics of live stock disease can be only estimates.

The disease is seldom encountered in the eastern part of North Dakota and it is likewise probably rare in Minnesota. It seems therefore to be of little significance in the Red River Valley. A little farther west, it occurs frequently in the glacial drift plain, but the northern part of the State and along the Souris River is no doubt seriously involved. The Missouri plateau east and north of the river is likewise a district of high frequency. The land in the hills of the Altamont moraine across much of the State seems to be more often concerned than the flats below. It is likewise serious in the western part of the State.

Reports from some of the men in the field indicate that they have seen but a few affected cattle. Others report having "seen so many outbreaks that I have kept no record," or about a third of the cattle and occurring each year or "probably three out of every ten herds in a large area were infected one year." The number in a herd varies from one or two affected animals to practically the entire herd except a few of the older cattle. Outbreaks of considerable magnitude have been noted in districts where it has never been previously observed and yet the source of the infection can scarcely be determined.

Mortality: European writers estimate the case mortality at from 2 to 20 per cent with a more serious prognosis in the younger cattle. Meyer¹⁵ stated that he had observed coccidiosis in Switzerland where it has always been considered a mild intestinal infection. He asserted that it is not an infection which leads to the death of the animals. Our experience in North Dakota is certainly to the contrary. The symptoms and lesions of the disease in this district agree with those of the European writers but the mortality is higher. Most veterinarians report that from

10 to 50 per cent of the untreated affected young animals die of the disease. The age susceptibility observed in this region is similar to that of most writers. It does not seem to occur in calves which are only a few weeks of age, as noted by Smith and Graybill. The animals are usually at least 4 to 6 months old but calves which are still nursing the cows are sometimes infected.

Seasonal occurrence: The disease rarely occurs during the spring and summer months, although sporadic cases do occur. It is therefore not a problem of any significance until the late fall and early weeks of winter. Outbreaks sometimes appear in October, although few are noted before the last of November and December, when the disease seems to reach its height. Its occurrence decreases with the approach of spring.

The appearance of the disease seems to be synchronous with the advent of more severe winter weather or with one of its sudden changes. That fact is one of the most striking features in the epizootology of the disease. Some observers believe that it is more common during severe winters with early snows than when the weather is milder and more open. The cattle are rarely on pasture although they may range on the frozen fields during part of the day. Snow may or may not cover the ground. It frequently develops shortly after the cattle are changed from pasture, which may be the dry range, to the feeding of hay, corn fodder or other forage in the yard. There is often a severe snow storm about the time the symptoms appear but how this devitalizing influence precipitates the disease which presumably has a fairly definite incubation period is so far unexplainable. It is possible that this frequency of occurrence may be the result of lowered vitality or resistance on the part of the cattle resulting from low temperatures and the severe winter weather. If that factor is primarily concerned, the relative infrequency of the disease in eastern North Dakota and Western Minnesota is determined largely if not entirely by the absence of infected feed and soil but an increasing frequency may not be unexpected in the near future and an extension of the infected territory occur.

The surface water in the sloughs and pot-holes is invariably frozen but the cold water available from the wells in tanks may reduce the intake and thereby constitute a possible detrimental physiologic influence. It is difficult indeed accurately to incriminate and correlate such predisposing factors which are often of short duration and effective often immediately preceding the attack with definite incubation periods which have been obtained

in the experimental infections. Moreover, it seems impossible to secure definite consistent positive information which will show the source of the infection.

Physiography: Much of the terrain in the states of North Dakota and Montana and the adjacent Canadian provinces of Alberta and Saskatchewan is included in the Northern Great Plains area. This grassland biota is naturally covered by a more or less dense sod of perennial grasses. This rolling prairie plateau slopes eastward from the Rocky Mountains to the Red River Valley in eastern North Dakota and Manitoba. The glaciated area in the eastern part of this district has imperfect drainage in that there are many lakes, small sloughs and pot-holes. While the moisture of these low places may conceivably enable the oöcysts to sporulate and thereby spread the infection, this feature of the land is less applicable to the western section. Nevertheless, coccidiosis occurs in western North Dakota, Montana and Saskatchewan. This Missouri plateau is supplied with an ample and more ancient drainage system than the glaciated area to the east.

Precipitation: The annual precipitation over practically this entire area is less than twenty inches so that twelve to fifteen inches in many areas is not subnormal. Except for the snowfall, most of the moisture falls in the spring and summer months. Obviously in this latitude during the winter months, the general lack of thawing weather and the prevalence of zero temperatures is not conducive to the prompt sporulation of coccidian oöcysts. Those oöcysts contained in infected feces, when placed outside at the prevailing winter temperatures have failed to show evidence of development until spring. It seems, therefore, that the asexual or exogenous cycle of reproduction outside the host occurs during the spring and summer months. Moreover, there is probably no danger in the spread of the disease from infected animals during the winter months.

Why infestation fails to appear more frequently during the summer and fall, while the cattle are on pasture and the range, with access to the low moist coulees and pot-holes, is certainly a mystery when compared with the observations of European writers. Neither does the high frequency seem to be correlated with wetter years, as reported by Zublin¹⁶ in Switzerland. It is true that cattle are often out during the more open weather, when there is little snow, with access to the same pasture conditions when frozen but then the disease appears. This is not

constant, however, because in many cases hay and forage must be incriminated for the cattle had been in the yards for weeks. Irrigation is little concerned in the area familiar to the writer although Marsh believes that it may be involved in Montana inasmuch as much of the alfalfa hay is grown on low or irrigated fields, while little trouble is encountered with upland or prairie hay.

Pathogenesis: Only a few workers seem to have reproduced the disease so that the number of reported experimental infections with coccidiosis is small. Guillebeau and Hess (noted by Railliet),² Montgomery¹⁷ and de Blicke and Douwes¹⁸ found incubation periods of approximately three weeks in experimental infections. Bruce,¹² on the other hand, produced infection in six cattle in about 14 days after feeding infected feces. The writer succeeded in infecting two calves by the feeding of sporulated oöcysts contained in feces from infected animals. The oöcysts appeared in the feces in 12 and 13 days respectively after the infected material was given. Bruce postulates the presence of a new species of coccidium, *E. canadensis*, as the causative agent in the British Columbian outbreaks rather than *Eimeria zurni* of the European writers. The different seasonal occurrence and a shorter incubation period in the territory included in this paper and British Columbia may further support his assumption.

The writer has carefully examined many matured oöcysts but has been unable to distinguish structures differing from the original European descriptions. Each oöcyst, however, contains four sporocysts which are irregularly arranged and each of those contains two sporozoites. Few spherical oöcysts have been noted, so that most of them were oval in shape. Eighty-seven oöcysts were measured from seven different animals which were probably at least six months of age. They varied in size from 13.7 to 19.8 microns in length and from 12.0 to 18.3 microns in width, with an average size of 17.1 by 15.2 microns.

These few reports of successful experimental infections and the writer's difficulties in reproducing the disease, with the probability that the unsuccessful attempts of some workers are not mentioned, suggests that some accessory or predisposing factors are involved in addition to the ingestion of ripened oöcysts. The disease seems to be even more frequent where there is no reason for its appearance so far as a possible source of infection can be determined than the successful experimental infections. Zublin recognized that apparently robust, sound, well-

developed individuals become affected at least as frequently as emaciated, weak animals. Few reports of recurrence on the same farm on successive years have been secured.

The danger of permanently infected land is therefore as yet but a nominal one, although we have little or no definite information to show how long the infection will remain alive under external conditions. Furthermore, the experimental difficulties involved in securing such information are even more real than apparent. While cattle may be carriers, as reported by some workers, the writer has never been able to find oöcysts in the feces of cattle in healthy herds or from those in affected herds which did not present the clinical symptoms of coccidiosis. The frequency of the occurrence of the disease in the Northwest is at least highly suggestive that some accessory or predisposing factors are operative at times in addition to the accessibility of the causative coccidia.

Upland hay of good quality and the entire absence of low wet areas in the pasture are involved, as well as low pastures and slough hay. Crops grown on farm land in cultivation seem involved as well as original prairie sod in pasture and hay land. It is difficult to find a consistent correlation of the casual oöcysts as carried by certain feeds, water supply, types of pasture or topography and drainage of the land, to the occurrence of the disease. If cattle develop the disease while fed on corn fodder, alfalfa, straw, silage, oats, sweet clover, timothy and upland prairie hay while in the yard and watered from the well, it would seem that intelligent successful prevention will be accomplished with difficulty. It looks like a better opportunity for good, intelligent medical treatment and nursing than for immunization procedures as a means of reducing losses from this protozoan disease.

REFERENCES

- ¹Knuth, P., & de Toit, P. J.: Die Kokzidiose des Rindes. C. Mense, Handbuch der Tropenkrankheiten (2nd ed.), vi, p. 523.
- ²Raillet, A.: Intestinal coccidiosis. Rec. de Med. Vet., xcv (1919), p. 5.
- ³Hutyna, F., & Marek, J.: Spezielle Pathologie u. Therapie der Haustiere (6th ed.), ii, p. 379.
- ⁴Schultz, C. H.: Mysterious losses among cattle in the Pacific Northwest. Jour. A. V. M. A., llii (1918), n. s. 6 (6), pp. 711-732.
- ⁵Marsh, H.: Coccidiosis in cattle in Montana. Jour. A. V. M. A., lxii (1922), n. s. 15 (5), pp. 648-652.
- ⁶Smith, T., & Graybill, H. W.: Jour. Exp. Med., xxviii (1918), p. 89.
- ⁷Dykstra, R. R.: Red dysentery of cattle (coccidiosis). No. Amer. Vet., i (1920), 2, p. 90.
- ⁸Muldoon, W. E.: Intestinal coccidiosis in calves. No. Amer. Vet., i (1920), 1, p. 37.
- ⁹Frank, W. E.: Coccidiosis in feeder cattle. Jour. A. V. M. A., lxix (1926), n. s. 22 (6), pp. 729-733.
- ¹⁰Lentz, W. J.: Intestinal coccidiosis. Jour. A. V. M. A., liv (1919), n. s. 7 (2), pp. 155-156.
- ¹¹Barnes, M. F., & Brueckner, A. L.: Some cases of interest. Jour. A. V. M. A., lxxi (1927), n. s. 24 (4), pp. 514-523.
- ¹²Bruce, E. A.: Bovine coccidiosis in British Columbia, with a description of the parasite, *Eimeria canadensis* Sp. N. Jour. A. V. M. A., lviii (1921), n. s. 11 (6), pp. 638-662.
- ¹³Gwatkin, R.: Bovine coccidiosis. Vet. Med., xxi (1926), 8, pp. 384-385.
- ¹⁴Way, W. D., & Hagan, W. A.: Corn. Vet., x (1920), p. 17.

¹⁵Meyer, K. F.: In discussion of: Schultz, C. H.: Coccidiosis in cattle and carabaos in the Philippine Islands and its relation to rinderpest. Jour. A. V. M. A., xlviii (1908), n. s. 1 (6), pp. 702-704.

¹⁶Zublin, E.: Beitrag zur Kenntnis der Roten Ruhr des Rindes. Inaug. Diss., Zurich, 1908. Schweiz. Arch. Tier., 1 (1908), p. 123.

¹⁷Montgomery, R. E.: Ann. Rpt. of the Veterinary Pathologist, East Africa Protectorate, 1910-11.

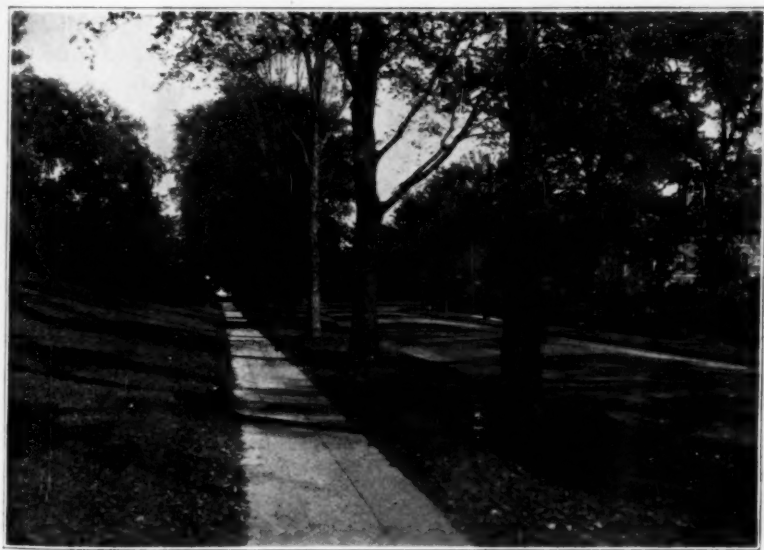
¹⁸De Blicke, L., & Douwes, J. B.: Deut. Tierarzt. Wehnschr., xxi (1920), S. 241.

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One of the delightful shaded walks of the University Farm Campus.

CORRELATION OF THE RAPID AND THE LONG AGGLUTINATION TESTS FOR INFECTIOUS ABORTION OF CATTLE*

By H. F. LIENHARDT and CHAS. H. KITSELMAN

Kansas State Agricultural College, Manhattan, Kansas

The purpose of this report is to focus attention upon the rapid method of diagnosing Bang's abortion disease and to stimulate the publication of similar work.

Following the method outlined by Huddleson and Carlson,¹ it was thought advisable to correlate the results from routine samples submitted to the Pathology Research Laboratory of the Kansas State Agricultural College, secured by the new or rapid method and by the old, time-honored method, in order to determine the efficiency of the former.

The first few samples were tested using the identical technic described by the above workers. During the early development of proficiency with this method, minor objections were encountered which prompted us to make deviations from the strict technic followed up to that time. Foremost among these minor objections was the smallness of the ruled squares on the glass plate. The authors found a square one and one-half inches by one and one-half inches to be more satisfactory and completely overcame the tendency of the test fluids to overrun their squares, especially since a short period of rotary agitation was found to be highly desirable to obtain a quicker and more complete agglutination in positive samples.

The antigen was prepared in accordance with the method outlined by the Michigan workers.

Glass plates of ordinary clear window-glass, nine and one-half inches square, were ruled off for six samples of five dilutions each by means of a diamond marking pencil.

Because of the labor necessary to mix the antigen and the serum completely with a toothpick or match stick, and the feeling of always having an unsatisfactory mixture, a better method was sought. To accomplish this the tip end of a 1-cc pipette was used and the square containing the greatest dilution was mixed first, and so on until the first, or 1-25, dilution square was mixed.

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One sterile pipette was used for each sample run and it was found quite convenient to measure the serum and mix the serum and antigen before laying the pipette down. The mouth of the pipette must be kept tightly covered by the index finger to minimize capillary attraction, and the pipette should be dipped in the antigen before the serum is drawn in to make the mixture. This decreases the danger of carrying serum from one dilution over to another or from one square to another.

After thoroughly mixing, the plate is passed rapidly through the flame of the Bunsen burner, and is warmed slightly above body temperature, that is, slightly warm to the back of the hand. A little experience is necessary to judge the correct temperature and exposure to the flame. The reaction is now timed by means

TABLE I—Comparison of rapid and long agglutination tests

NUMBER OF SAMPLES POSITIVE		NUMBER OF SAMPLES NEGATIVE		TOTAL NUMBER OF SAMPLES
RAPID METHOD	LONG METHOD	RAPID METHOD	LONG METHOD	
29	30	30	29	59
		7	7	7
3	3			3
3	4	22	21	25
9	9	33	33	42
19	18	80	81	99
42	40	101	103	143
11	11	52	52	63
8	8	3	3	11
18	18	1	1	19
30	31	99	98	129
172	172	428	396	600

of a five-minute interval timer; any reaction occurring later is disregarded because the effect of evaporation produces spurious readings.

Tabulations of 600 different samples (table I) which were sent in during several months from various sections of the state of Kansas were examined by one of us and with but two exceptions were examined and then retested as a check upon the behavior of the samples. It was impossible to retest these samples because of insufficient serum and the difficulty encountered in obtaining more blood. Since there was no disagreement in the tests that were made, it is unlikely that any error is introduced by including these exceptions among the six.

Huddleson and Carlson report 100 per cent agreement for 2000 bovine sera tested when clumping was complete or incomplete in .04 cc or less of serum.

Our comparisons show a disagreement of approximately 1 per cent or 0.5 per cent for each method. This is so small that for all practical purposes it may be considered of negligible importance. Attention should be drawn to the fact that the rapid method yielded 172 reactors and the long method yielded a like number, showing in this case 100 per cent agreement. The number of negative cases were likewise equal by both methods. In this laboratory the short method has proven to be highly satisfactory and because of the ease with which the test can be performed and the speed with which a diagnosis can be made is to be preferred and will become a permanent diagnostic method in the testing of all routine bovine sera for Bang's abortion disease. In work demanding greater accuracy both methods will be employed.

REFERENCE

¹Huddleson, I. F., & Carlson, E. R.: A rapid method of performing the agglutination test in the serum diagnosis of Bang's abortion disease in cattle. *Jour. A. V. M. A.*, lxx (1926), n. s. 23 (2), pp. 229-233.



Barn of the Division of Veterinary Medicine, University of Minnesota, where the cattle in connection with experiments on bovine infectious abortion are quartered.

INVESTIGATIONS ON THE TRANSMISSION AND ETIOLOGY OF HOG FLU*

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INTRODUCTORY

The disease, which has come to be known as "hog flu," first attracted the attention of veterinarians and swine-breeders in the fall of 1918, when the great outbreak of human flu was sweeping over the country, and this fact, coupled with some similarity in the clinical symptoms of the two diseases, served to engraft the term "flu" on this seemingly new swine epizootic. The term "flu," however, is a poor one, as it conveys but little meaning and does not adequately describe the disease. Considering the clinical manifestations of the disease and its usual course, when uncomplicated, the term "infectious bronchitis of swine" would seem to be a better definition of the disease. The disease has also been designated as "broncho-pneumonia of swine," but this term does not seem to be an altogether proper one for reasons which will be given later. Inasmuch as the disease has been fully described in veterinary literature, only a brief description of it will be given here.

DESCRIPTION OF THE DISEASE

The onset of hog flu is sudden, an entire herd often coming down within 24 to 48 hours. The clinical symptoms in an uncomplicated case are those of a bronchitis. The most characteristic symptoms, more or less in order of their appearance, are: loss of appetite, disinclination to move, fever, jerky or thumpy respiration, and cough. The affected animals may present a very sick appearance for several days, after which there is usually a marked and rapid improvement, which may be quite as surprising as the sudden onset. In mild, uncomplicated cases, the disease may run its course within a few days to a week. There is, however, practically always a marked gaunting up or loss in weight, which is often out of proportion to the severity of the attack. This loss in weight is not recovered rapidly and constitutes a serious economic loss to the farmer or

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hog-raiser. The mortality in uncomplicated cases is low (from 1 to 3 per cent) and often the entire herd recovers without any loss. In fatal cases, a terminal pneumonia ensues, which is of the lobular type, and this has led to the term "broncho-pneumonia of swine." However, in view of the fact that the great majority of the affected animals recover before the initial bronchitis has developed into pneumonia, the term "broncho-pneumonia" is not a good one for this disease. About the only lesions seen in fatal cases are patches of pneumonia in the lungs, with marked enlargement and congestion of the lymph-glands lying along the trachea.

The disease has a marked seasonal incidence, prevailing mostly in the late fall and early winter, and would seem to result from a lowering of the bodily resistance from cold and exposure.

There appears to be little, if any, immunity following an attack of this disease, since it seems to be quite well established that the same herd may suffer from two or even three attacks of flu in one season.

There is no specific treatment for the disease. However, if the affected animals are given good care and attention and are provided with good sleeping-quarters, free from drafts, good dry bedding free from dust, and are given a light diet, there is usually little loss and frequently the entire herd recovers. Drugs or drug compounds, which are supposed to act as respiratory disinfectants, are usually prescribed by the practicing veterinarian and may or may not be of some value.

PREVIOUS INVESTIGATIONS

Descriptions of the disease have been given by Murray,¹ Dimock and Healy,² Kinsley,³ Dreher,⁴ and McBryde.⁵ The latter author has also called attention to the rather sharply defined seasonal prevalence of the disease in Iowa. Hasting^{6,7} thinks that the disease has a marked influence on the birth-rate in swine, causing sterility in the male and abortion in the female. A review of the literature on hog flu, however, reveals very little work on the etiology of the disease.

Murray⁸ isolated and described a small Gram-negative micrococcus, which he thought might be the etiological factor, but later investigations have failed to confirm his findings.

Dorset, McBryde and Niles⁹ published a preliminary report of their bacteriological studies of hog flu, in which they reported finding *B. suis* in about 50 per cent of the cases studied

and a non-hemolytic streptococcus from a like proportion of the cases. They were not able, however, to reproduce the disease with pure cultures of the last-mentioned organism.

R. S. Spray¹⁰ made a study of the bronchial flora of 100 apparently normal lungs and 314 pneumonic lungs taken from hogs slaughtered at one of the large Chicago meat-packing establishments. In the normal lungs he found *B. suis* in 4 per cent of the cases studied, while in 12 per cent he found an inulin-fermenting streptococcus, which was pleomorphic and at times showed bacillary forms. In the pneumonic lungs he found *B. suis* in 54 per cent of the cases, while the pleomorphic inulin-fermenting streptococcus was present in 35 per cent. Spray states that the inulin-fermenting streptococcus appeared to possess highly invasive powers in hogs, but was not markedly pathogenic for white mice or rabbits.

PRESENT INVESTIGATIONS

These investigations have included field observations on some thirty-five sick herds in various sections of Iowa, made over a period of seven years, from 1919 to 1926. Material for study (blood, tissues, cultures, etc.) were obtained from many of these herds. In a number of instances, sick animals were obtained, which were brought to the Bureau experiment station at Ames and killed in order to obtain cultures and material for the inoculation of well pigs. In other instances, sick hogs were borrowed from farmers having flu herds and were used for exposure or contact experiments and afterwards, upon recovery, returned to their owners. The noses of the borrowed flu hogs were usually swabbed with sterile cotton swabs and the nasal secretion thus obtained was used for the inoculation of well hogs.

In view of the fact that hog flu and hog cholera are prevalent at the same season of the year and may be associated in the same herd, the endeavor was made in this study to select flu herds which had been previously immunized against hog cholera in order to rule out the possibility of a concomitant infection. Furthermore, in selecting flu herds for observation and experimental study, it was the aim to select herds which were in the early or acute stages of the disease, that is, when the animals were showing the characteristic, thumpy respiration, together with cough and elevation of temperature.

The propagation of the disease experimentally was attempted in the following ways: (1) by injecting well hogs with the blood

of flu hogs, (2) by dropping suspensions of the tracheal and bronchial mucus of flu hogs in the noses of healthy hogs, (3) by dropping suspensions of the nasal secretion of flu hogs in the noses of healthy hogs, (4) by the association of well hogs with flu hogs in the acute stages of the disease, and (5) by dropping cultures recovered from flu hogs in the noses of healthy hogs and the intratracheal injection of healthy hogs with such cultures.

In most of the experiments with hog flu which are described later, shotes which had been previously immunized against hog cholera were used in order to obviate any possibility of cross-infection, as it has been found that shotes which have been immunized against hog cholera are equally as susceptible to hog flu as those which have not been immunized against hog cholera. In the course of these experiments it appeared that shotes weighing around 150 pounds and in good condition were most susceptible to hog flu.

INOCULATION EXPERIMENTS WITH THE BLOOD OF FLU HOGS

Nine shotes, weighing from 45 to 85 pounds each, were given subcutaneous injections of blood (5 to 40 cc) obtained from flu hogs on farms located in different parts of Iowa. The blood samples used for these injections were obtained from nine different herds in which the hogs were suffering from acute flu.

These injections yielded entirely negative results, all of the injected animals remaining perfectly well in spite of the fact that they received relatively large amounts of blood taken from flu hogs.

These results would seem to demonstrate quite conclusively that the causative organism in hog flu does not circulate in the blood-stream.

INOCULATION EXPERIMENTS WITH THE TRACHEAL AND BRONCHIAL MUCUS OF FLU HOGS

In order to obtain the necessary material for these experiments, flu hogs showing characteristic symptoms were killed in the acute stages of the disease. The trachea was tied off just below the larynx, and the lungs removed entire with the trachea and larynx attached. The esophagus was dissected away from the trachea, which was then seared and slit open with sterile instruments down to the bifurcation of the bronchi. The tracheal mucus, which is usually quite abundant and often blood-tinged, was removed by means of a sterile spatula and

transferred to small, sterile flasks containing glass beads. By compressing the lungs slightly and at the same time raising the posterior lobes upward, additional mucus could often be forced from the larger bronchi into the trachea, and the secretions used in these experiments were usually mixtures of tracheal and bronchial mucus.

Small amounts of sterile salt solution (5 to 10 cc) were added to the flasks containing the mucus and the flasks were shaken vigorously to break up and disintegrate the mucus. The suspensions of mucus thus obtained were then drawn up in sterile pipettes and dropped in the nostrils of well hogs. The material used in these experiments was obtained from thirteen flu herds located in various parts of Iowa.

Twenty shotes, weighing from 50 to 170 pounds, were exposed to hog flu in the manner described, with the result that seventeen (85 per cent) developed the characteristic symptoms of flu. In some of the inoculated animals, there were only slight symptoms of flu, from which the animals soon recovered, while in others well-marked symptoms developed, and in one or two instances the animals succumbed. In a number of these cases, which will be referred to as "experimental flu," the animals were killed after the development of characteristic flu symptoms in order to obtain cultures and the tracheal and bronchial mucus secured from these cases was used, in the manner described above, for the inoculation of other well hogs. In this manner the disease was successfully carried over in some cases through several transfers from animal to animal.

These inoculation experiments with tracheal and bronchial mucus of flu hogs have demonstrated that the disease may be conveyed quite readily by dropping suspensions of these secretions in the nostrils of well hogs. It is quite evident, therefore, that the infectious agent of hog flu is present in the tracheal and bronchial secretions.

In some of our earlier inoculation experiments, more particularly those carried out in 1923, spraying with cold water immediately after treatment was resorted to, with a view to lowering the bodily resistance of the inoculated animal, but in subsequent experiments this was found to be unnecessary.

INOCULATION EXPERIMENTS WITH THE NASAL SECRETION OF FLU HOGS

In carrying out these experiments, small, sterile cotton swabs, like those used for obtaining diphtheria cultures, were employed.

By means of these, the nostrils (i. e., anterior nares) of flu hogs were swabbed and the nasal secretion thus obtained was suspended in a small quantity of sterile, normal salt solution. The suspension of nasal secretion was then dropped in the noses of well hogs.

Seventeen shoters, ranging in weight from 60 to 185 pounds, were inoculated in the above manner. Eight received nasal secretion obtained from cases of natural flu on farms and nine were inoculated with nasal secretion obtained from cases of experimental flu. Eleven of these animals developed typical flu.

In these experiments the disease was transferred from sick to well hogs in approximately 65 per cent of the cases by means of the nasal secretion dropped in the nose, from which it would appear that the causative agent is frequently present in the nasal secretion of flu hogs.

Inasmuch as hogs are constantly rubbing noses, it would seem that the causative agent or organism might be effectively and quickly transferred from sick hogs to well hogs through the nasal secretion, and the incubation period of hog flu being extremely brief, the disease might thus be very rapidly disseminated through a herd. This might possibly afford an explanation of one of the puzzling features of hog flu, which is the suddenness with which the disease invades a herd and the large number of animals that are affected soon after the disease is first noted.

TRANSMISSION OF THE DISEASE BY CONTACT EXPOSURE

A number of experiments were carried out, in which well shoters were placed in pens with shoters which were suffering from natural or experimental flu.

A total of thirty-two healthy shoters were exposed by contact association in this manner and of this number thirteen, or something over 40 per cent, contracted flu.

These experiments in contact exposure extended over several years, i. e., from 1922 to 1926. When they are grouped by years, there was quite a difference in the proportion of positive results. Thus, in 1922-1923, there were fifteen exposures, with four positive results; in 1924, there were nine exposures, all of which gave positive results; in 1925-1926, there were eight exposures with no positive results.

It has been somewhat difficult to explain this difference in results of the exposure tests, but it would seem that there must be a considerable variation in the virulence of the disease from year to year.

FILTRATION EXPERIMENTS WITH TRACHEAL AND BRONCHIAL MUCUS

With a view to determining whether the causative agent in hog flu is in the nature of a filtrable virus, five filtration experiments were carried out with diluted tracheal and bronchial mucus, using small Berkefeld or Mandler filters. In two of these experiments, the mucus was obtained from hogs suffering from natural flu on farms and in the other experiments the mucus was obtained from cases of experimental flu.

In carrying out these experiments, the mucus was transferred to small sterile flasks containing glass beads, diluted with 30 to 40 parts of sterile salt solution and thoroughly shaken to disintegrate the mucus. The diluted mucus was first passed through coarse filter paper to remove the larger particles and then through the bacterial filters. Unfiltered and filtered portions of the diluted mucus were dropped in the noses of well hogs.

In three of these experiments, the hogs which were given the *unfiltered* mucus developed typical flu symptoms, whereas those receiving the *filtered* mucus remained entirely normal. In two of the experiments no symptoms of flu were produced by either the unfiltered or the filtered mucus.

While these experiments are too few in number, perhaps, to be conclusive, they nevertheless point very strongly to the conclusion that the causative organism in hog flu is not in the nature of a filtrable virus.

Bacteriological Investigations

CULTURAL STUDIES OF FLU HERDS ON FARMS

Since 1919, a bacteriological study has been made of twenty flu herds, located in nine counties, in various sections of Iowa.

Cultures were made from the tracheal and bronchial mucus, the lungs, and bronchial glands of flu hogs on glycerin agar (pH 7.5) and glycerin agar (pH 7.5) to which sterile normal hog serum was added. The growths were transferred to meat-infusion broth and serum broth (pH 7.2) and incubated for 48 hours at 37.5° C. Glycerin-agar and serum-agar plates (pH 7.5) were streaked with the broth cultures and incubated for 48 hours at 37.5° C. Numerous colonies were picked and transferred to meat-infusion broth and serum-broth and incubated for 48 hours at 37.5° C. The cultures which showed growth were examined for motility at 18 to 24 hours and trans-

ferred to glycerin-agar and serum-agar (pH 7.5) for further study.

In considering the bacteriological findings in this study of flu herds, only two types of organisms were isolated with any degree of frequency. A pleomorphic, Gram-positive bacillus, which appeared on glycerin-agar and serum agar plates as minute, transparent colonies, was found in eleven of the twenty herds (55 per cent), while *B. suis* was present in thirteen of the herds (65 per cent). In six of the herds both organisms were found. In two of the herds *B. bronchiseptica* was present and in three herds *B. pyogenes* was found in association with the two organisms first mentioned.

CULTURAL STUDIES OF CASES OF EXPERIMENTAL HOG FLU

In addition to the bacteriological study of twenty flu herds, which has just been described, a similar study was made of twelve cases of experimental flu. These were cases in which typical flu was produced in well hogs by dropping in the nostrils of these hogs the nasal secretion or the tracheal and bronchial mucus of flu hogs. After the development of characteristic symptoms, such as thumpy respiration, fever, and cough, the animals were killed for postmortem examination and culturing. In these twelve cases of experimental flu, the same pleomorphic bacillus, noted in flu herds, was found in six cases (50 per cent), while *B. suis* was present in ten (83 per cent). *B. bronchiseptica* and *B. pyogenes* were each found once, in association with one or the other of the two first-mentioned organisms.

In comparing the bacteriological studies of flu hogs on farms with the studies made of experimental cases of flu, it will be noted that the pleomorphic bacillus was present in about the same proportion of cases, whereas *B. suis* was found in a somewhat higher proportion of the cases of experimental flu.

CULTURAL STUDIES OF THE BACTERIAL FLORA OF THE TRACHEA AND LUNGS OF NORMAL HOGS

In order to make a comparison of the bacterial flora of the trachea and lungs of flu hogs with the corresponding flora of well hogs, an arrangement was made with the officials at a Government-inspected packing company at Des Moines, by which the lungs of normal hogs could be secured.

In examining the lungs taken from hog carcasses handled in the usual manner, it was found, in nearly every instance, that the dirty water of the scalding-vat had entered the trachea

and had often passed downward as far as the bifurcation of the bronchi. This, of course, rendered the specimens unsuitable for the taking of cultures from the trachea and there was also the possibility that the dirty vat-water might have entered and contaminated the lungs. In order to obviate this difficulty, the officials of the packing-plant very kindly handled a limited number of hog carcasses from time to time in the following manner. After sticking and bleeding out, the carcass was dropped on a platform instead of being dropped into the scalding-vat. The carcass was then gradually lowered into the scalding-vat, tail first, and the head was held above the vat-water as the carcass passed through the scalding-vat, so as to prevent the entrance of the vat-water into the trachea. The carcass was then scraped and cleaned in the usual manner.

Before the lungs were removed from the carcass, the trachea was tied, just below the larynx, and the lungs removed with the trachea and larynx attached. All specimens in which the trachea had been cut or even nicked were rejected. In this way specimens were secured which had not been contaminated by the vat-water.

The specimens secured for bacteriological examination were taken from healthy hogs, which had been passed by inspectors of the U. S. Bureau of Animal Industry. Twelve specimens were secured in April, 1925, and seven in August, 1925. The specimens were taken from hogs weighing from 150 to 250 pounds.

Immediately after removal from the carcass, the specimens were placed on ice and taken to the Bureau station at Ames. Cultures were taken from the upper portion of the trachea and from a point near the bifurcation of the bronchi. Cultures also were taken from the lung by first searing the surface of the lung, midway between the posterior tip and the lower end of trachea, and then cutting down with a sterile knife so as to expose the main bronchus, which was scraped and opened. Small, sterile cotton swabs were used in removing the mucus from the trachea and bronchi. The swabs were washed off in 1 or 2 cc of sterile normal salt solution and the resulting suspensions used for the streaking of plates of glycerin agar (pH 7.5) to which filtered, sterile hog serum was added before pouring. Selected colonies were replated and pure cultures isolated for identification. Anaerobic shake cultures were also made in deep tubes of glycerin agar (pH 7.5) which had been

previously boiled to expel air. No strictly anaerobic forms were noted, however.

In a bacteriological study of the tracheal and bronchial flora of nineteen normal hogs slaughtered at a Government-inspected packing-plant, *B. suis* was found in seven (37 per cent) and the organism noted in flu hogs and described as a pleomorphic, Gram-positive bacillus was present in five (26 per cent). In addition to these organisms, *B. coli communior* and *Staphylococcus albus* were found as contaminants in several of the specimens examined.

DESCRIPTION OF THE ORGANISM DESIGNATED AS A PLEOMORPHIC
GRAM-POSITIVE BACILLUS

MORPHOLOGICAL AND CULTURAL CHARACTERISTICS

The organism is a Gram-positive, short plump bacillus, occurring singly, in pairs, and in clumps, when first isolated. After several transfers on glycerin-agar, serum-agar and meat-infusion broth (pH 7.2 and 7.5) the organism appears in a variety of forms, some oval, sometimes in short chains in the form of cocci, and there are numerous diplococcoid forms. It is apparently very pleomorphic and the bacillary forms tend to become smaller. Several attempts to demonstrate capsules have failed. The organism is non-motile and does not form spores.

In meat-infusion broth (pH 7.2) there is delicate, uniform clouding in 24 to 48 hours at 37.5° C., without pellicle formation. After seven days at room temperature, the growth settles to the bottom of the tube in the form of a precipitate and dies, that is to say, it is not possible to obtain growth from the sediment. The growth on glycerin-agar and serum-agar slants (pH 7.5) appears as minute transparent colonies which coalesce in a delicate film over the surface after several days at room temperature. It grows well all along the line of stab in glycerin-agar and serum-agar, without any radiations from the line of puncture. It does not liquefy gelatin nor hardened serum, but produces a small zone of hemolysis around each colony on blood-agar plates in 48 hours at 37.5° C. When first isolated, it fails to grow on meat-infusion agar (pH 7.2 and 7.5) and dies rather quickly on glycerin-agar and serum-agar (pH 7.2 and 7.5), and requires frequent transfers. After numerous transfers, however, the growth remains alive for months in 5 per cent glycerin broth (pH 7.5) containing 0.5 per cent agar, when stored in an ice-box.

Litmus milk is usually coagulated, with a red zone at the top of the tube, in 48 hours at 37.5° C., and the red zone gradually extends downward to the bottom of the tube in two to three weeks. When Russell's double-sugar medium slants are streaked with this organism, a uniform red color is produced throughout the medium.

The organism ferments glucose, lactose, saccharose, inulin, and salicin without producing gas. The addition of these sugars to meat-extract broth seems to inhibit the growth of the organism. However, when a small quantity of sterile beef serum was added, in addition to the sugars, a good growth was obtained.

Agglutination tests were carried out with a serum obtained from a rabbit by injecting the animal intravenously at weekly intervals with graduated doses of a 48-hour broth culture of the pleomorphic bacillus. One week after the fourth injection, an agglutinating serum was obtained which had a titer of 1 to 160 for the bacillus. This serum failed to agglutinate *B. suis-septicus* in any dilution.

B. suis-septicus agglutinating serum was obtained in the same way, with the exception that the 48-hour broth culture was previously heated in a water-bath for one hour at 60° C., before being injected intravenously. The serum obtained one week after the fourth injection had a titer also of 1 to 160. This serum failed to agglutinate the pleomorphic bacillus in any dilution.

PATHOGENICITY TESTS OF CULTURES OF THE PLEOMORPHIC BACILLUS AND OF *B. SUISEPTICUS* OBTAINED FROM FLU HOGS

Five guinea pigs were inoculated subcutaneously with different strains of the pleomorphic bacillus without producing any abnormal symptoms. Two rabbits were injected intravenously with a 48-hour broth culture and another rabbit received 48-hour broth cultures, poured in the nostrils, without the production of any abnormal symptoms in any of the animals.

Five guinea pigs, which were inoculated subcutaneously with different strains of *B. suis-septicus* obtained from flu hogs, died within 48 to 72 hours. Two rabbits inoculated subcutaneously with a 48-hour broth culture of one of the *B. suis-septicus* strains died within 48 hours. Another rabbit which received a broth culture of *B. suis-septicus* poured in the nostrils died within 24 hours.

Two rabbits which received mixed cultures of the pleomorphic bacillus and *B. suis* *septicus*, dropped in the nose, died within 24 hours.

From these tests, it would appear that cultures of the pleomorphic bacillus obtained from flu hogs were non-pathogenic for guinea pigs and rabbits, whereas strains of *B. suis* *septicus* obtained from the same source were highly virulent for these animals.

Attempts were made to infect well hogs by subcutaneous and intravenous injections of the pleomorphic bacillus and by dropping cultures or culture suspensions in the nostrils of well hogs, but we have been unable, as yet, to reproduce the disease with pure cultures of this bacillus.

SUMMARY AND DISCUSSION OF RESULTS

In the course of these experiments it was shown—it is believed for the first time—that hog flu can be quite readily transferred from sick hogs to well hogs by dropping suspensions of the nasal secretion or the tracheal and bronchial secretions of flu hogs in the nostrils of well hogs. It was shown also that the disease might be transmitted, though not so readily, through the association of well hogs with flu hogs and it would seem probable that when the disease is thus acquired through association or contact that it is transmitted through the nasal secretions. The disease could not be transmitted by means of blood injections and it would appear that hog flu is an affection which is strictly limited to the respiratory tract.

In the course of a study of the bacteria in the respiratory tract of hogs suffering from flu on farms, a pleomorphic, Gram-positive bacillus was found in 55 per cent of the cases studied, while *B. suis* *septicus* was present in 65 per cent of the cases. In cases of experimental flu, the pleomorphic bacillus was found in 50 per cent of the cases and *B. suis* *septicus* in 83 per cent. In a study of the bacterial flora of the respiratory tract of normal hogs, the pleomorphic bacillus was found in 26 per cent of the cases studied and *B. suis* *septicus* in 37 per cent. The two organisms were often found in association. In addition to these organisms, *B. bronchisepticus* and *B. pyogenes* were found in a few cases, but not in a sufficient number of cases to be of any significance.

In comparing the characteristics of our pleomorphic bacillus with the description given by Spray of the inulin-fermenting streptococcus recovered by him from the normal and diseased

lungs of swine, it would appear that these two organisms are probably identical, about the only points of difference being that our organism appears to be a pleomorphic bacillus rather than a streptococcus and seems to produce hemolysis around the colonies on blood-agar plates, whereas Spray describes his inulin-fermenting streptococcus as being non-hemolytic. In referring to the pathogenic properties of his organism, Spray describes it as "not markedly pathogenic for white mice or rabbits" and in this respect it agrees with our pleomorphic bacillus, which is non-pathogenic for rabbits. Spray also describes his organism as having "highly invasive powers in pigs," but cites no experiments to show what he means by this statement. Thus far, we have been unable to produce symptoms of illness in hogs inoculated with pure cultures of our pleomorphic bacillus.

If we combine the cases of natural and experimental flu which were studied culturally by us, it is found that *B. suisepiticus* was present in 70 per cent of the cases studied and the pleomorphic bacillus was present in 54 per cent. In Spray's study of the pneumonic lungs of swine, *B. suisepiticus* was present in 54 per cent of the cases and the organism described as an inulin-fermenting streptococcus in 35 per cent. If our conjecture be correct and our pleomorphic bacillus is the same as Spray's inulin-fermenting streptococcus, it will be noted that in our study of hog flu the two organisms were present in nearly the same relative proportion as in Spray's study of the pneumonic lungs of swine.

As regards the bacterial flora of normal lungs, however, our results do not correspond so closely with those of Spray. In our study of the tracheal and bronchial flora of normal hogs, *B. suisepiticus* was present in 37 per cent of the cases and the pleomorphic bacillus in 26 per cent, whereas Spray found *B. suisepiticus* in but 4 per cent of the cases studied and his inulin-fermenting streptococcus in 12 per cent.

In this connection, it is interesting to note that a pleomorphic streptococcus was isolated by two British investigators, David and Robert Thompson,¹¹ in the course of their studies on the etiology of human influenza. This organism appears to be similar, in some respects, to the one we have encountered in the influenza of swine. The authors just cited do not claim to have discovered the causative organism of human influenza, but point to the sig-

nificance of finding their organism in five cases of influenza and its absence in two normal individuals studied by them.

While we cannot and do not claim that the pleomorphic Gram-positive bacillus found by us is the causative organism of hog flu, we nevertheless wish to call attention to the fact that it was present in over 50 per cent of the cases of hog flu studied by us. It was found also in the respiratory tract of 26 per cent of the normal hogs which were studied. Although we have not as yet been able to demonstrate that this organism is invasive for hogs, it does not seem unreasonable to suppose that it may be one that takes on pathogenic properties when conditions are suitable, as in the case of pneumococcus (type IV) which lives in the throats of 20 per cent of normal, healthy human beings. The latter supposition would seem to be borne out by the presence of our pleomorphic bacillus in the respiratory tract of 26 per cent of the normal hogs which were studied, which corresponds very closely with the percentage of pneumococcus (type IV) in cases of human lobar pneumonia.

The very sudden onset of hog flu and the fact that a large proportion of the animals in a given herd are almost simultaneously affected would seem to point to some organism already present in the respiratory tract as the causative agent, this organism coming into play, that is, taking on pathogenic properties, when the resistance of the animals is lowered by exposure to cold or bodily chilling, as a result of poor housing conditions or from sleeping out in the open in the fall of the year, after the nights become chilly.

While the strains of *B. suis* isolated by us have possessed little, if any, virulence for hogs, except occasionally, when given intravenously, it would seem not unlikely that this organism may take on pathogenic properties under conditions of lowered resistance and in this way be responsible for the terminal pneumonia seen in fatal cases of hog flu. In view of the fact that *B. suis* is generally regarded as the cause of pneumonia in swine and was found by us in quite a large proportion (more than half) of our flu cases, it would seem that it may have an etiological significance in swine flu, at least in the fatal cases of the disease, which are always characterized by pneumonic lesions in the lungs.

CONCLUSIONS

1. Hog flu is an affection of the respiratory tract and the causative organism does not appear to circulate in the blood.

2. The causative organism of hog flu is present quite regularly in the tracheal and bronchial mucus and in the nasal secretion of flu hogs. The disease may be readily conveyed by dropping suspensions of the tracheal and bronchial mucus of flu hogs in the noses of well hogs and also by transferring the nasal secretion of sick hogs to the noses of well hogs.

3. Hog flu may be transmitted by contact exposure from sick hogs to well hogs and when so conveyed is probably transmitted through the nasal secretion.

4. The causative agent of hog flu does not appear to be a filtrable virus and is probably an organism which is present in

TABLE I—*Bacteriological findings in natural outbreaks of hog flu on farms in Iowa*

HERD NAME	COUNTY IN WHICH LOCATED	WHEN VISITED	BACTERIOLOGICAL FINDINGS			
			PLEOMORPHIC, GRAM POSITIVE BACILLUS	<i>B. suis-septicus</i>	<i>B. bronchi-septicus</i>	<i>B. pyogenes</i>
Sampson	Washington	October, 1919		+		
Olds	do	November, 1919		+		
Schultz	Cherokee	December, 1920	+			
Larsen	Montgomery	January, 1921		+		
Fox	Dallas	February, 1921		+		
Cole	Story	November, 1921	+			
Huntley	do	December, 1921	+	+		
James	Marion	February, 1922	+	+		
Sharts	Palo Alto	October, 1923		+		
Lyford	Story	November, 1923	+	+		
Horning	Washington	November, 1923	+			
Knox	do	November, 1923			+	
Edgar	do	November, 1923	+	+		
Latham	Story	December, 1923	+	+		+
Kingsbury	do	December, 1923	+			
Paetz	Kossuth	November, 1924	+			
Donaldson	Washington	November, 1924			+	
Stewart	do	November, 1924		+		+
Dallas	Dallas	February, 1925	+	+		+
Sloan	Linn	February, 1925		+		

the respiratory tract of hogs under normal conditions and assumes pathogenic properties when the bodily resistance of the animals is lowered.

5. A pleomorphic Gram-positive bacillus was recovered from the respiratory tract in over 50 per cent of the cases of hog flu which were studied bacteriologically and a similar study of the respiratory flora of nineteen normal hogs revealed the same bacillus in 26 per cent of the cases.

6. While the pleomorphic bacillus described in this paper has not been proven to be the causative agent in hog flu, its presence in a large proportion of the flu cases would seem to be of significance, and it is hoped that our bacteriological findings, although not conclusive, will be of interest to other investigators who may contemplate working along similar lines.

REFERENCES

- ¹Murray, Chas.: Swine flu. *Wallace's Farmer* (Feb. 25, 1921).
- ²Dimock, W. W., & Healy, D. J.: Influenza of swine, "hog flu," broncho-pneumonia. *No. Amer. Vet.*, iii (1922), pp. 138-141.
- ³Kinsley, A. T.: Swine "flu." *Vet. Med.*, xviii (1923), p. 314.
- ⁴Dreher, W. H.: Swine diseases as we find them in the field. *Jour. A. V. M. A.*, lxi (1922), n. s. 14 (2), pp. 178-181.
- ⁵McBryde, C. N.: Some observations on "hog flu" and its seasonal prevalence in Iowa. *Jour. A. V. M. A.*, lxxi (1927), n. s. 24 (3), pp. 368-377.
- ⁶Hastings, C. C.: Swine flu and its complications. *Jour. A. V. M. A.*, lxiv (1924), n. s. 17 (6) pp. 728-731.
- ⁷Hastings, C. C.: The influence of flu on the birth rate of swine. *No. Amer. Vet.*, vii (1926), pp. 45-46.
- ⁸Murray, Chas.: Notes on a micrococcus isolated from cases of broncho-pneumonia (so-called "flu") of swine. *Jour. A. V. M. A.*, lvii (1920), n. s. 10 (5), pp. 539-542.
- ⁹Dorset, M., McBryde, C. N. & Niles, W. B.: Remarks on "hog flu." *Jour. A. V. M. A.*, lxii (1922), n. s. 15 (1), pp. 162-171.
- ¹⁰Spray, R. S.: The bacteria in normal and diseased lungs of swine. *Jour. Inf. Dis.*, xxi (1922), pp. 10-21.
- ¹¹Thompson, D., & Thompson, R.: Investigations on the etiology of influenza. *Lancet*, cexii (May 28, 1927).

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THE DIAGNOSTICIAN IN SMALL-ANIMAL PRACTICE*

By FRANK E. McCLELLAND, *Buffalo, N. Y.*

This subject, although usually very little thought of, and classed under the theory section of Theory and Practice, is one with unlimited possibilities. The members of a profession so non-specialized as ours must of necessity have more experience and natural ability to stand out in prominence in their work, than the specialists of any science. I shall assume that a diagnostician is more than one who is just able to recognize a disease or pathological change, and shall bring into the discussion an undercurrent of ethics which can and should be used every day in our work. It is not my purpose to preach a sermon, but to give you the facts in plain language as I see them, not so much to tell you anything new but with the idea that it does us all good to "stand at the side of the road and see ourselves go by."

It is needless to say that in our profession, as in any other, success or failure lies in the development of personality, dignity and certain individual characteristics, the chief of which is unlimited patience. While this has always been true it is doubly true now with the change in character of our work and the spirit of the times. It is the backbone of our success in practice.

Given the proper personality and ability, experience will teach us the rest. You all know the adverse impression that the student or beginner in practice makes on the client. That lack of confidence must be overcome by the power of the diagnostician to judge quickly not only the character, temperament and intelligence of the animal, but the owner. Lack of experience has given many of us some hard lessons. I have always felt that those not in constant practice were a little untrue to the profession. Perhaps I have a one-track mind and cannot see it in the broader sense, but from personal contact and examples in other professions I do not believe that the practitioner whose mind is distracted by other lines of work can hope to be very successful as a diagnostician. The role in the drama of the professional man must be continuously and consistently played to be effective.

However, lack of experience does not excuse thoughtlessness, carelessness, lack of patience, or spirit of antagonism. These

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characteristics will result in loss of patient, client and your own self-respect and dignity. The well-balanced diagnostician makes thoughtfulness and carefulness his first assets. There is no reason why we should not use the modern diagnostic methods to the fullest extent. I doubt if there is one of you who does not daily use his microscope for skin or intestinal infestations, or mercurochrome or other fluorescent stains for corneal injuries or ulcers or either operates his own or takes his patients to a specialist in X-ray work. But most of us do not make use of diagnostic laboratories for sectioning of new growths or examination of blood and urine. At this point let me say that it is my opinion our lack of development in this direction is one principal reason why the veterinarian has not been able to command the price for his services in comparison to our sister profession. But the diagnostician's prime virtue is patience. It controls his manner in handling and examining the patient. Most pets, as you know, are not easily managed under rough or hasty handling, which also creates a feeling of hostility in the owner. Patience gives one wisdom in overcoming those tantalizing superstitions and distorted fancies one after another of our clients will use as arguments against our diagnosis. There is no doubt but that patience plus personality influence the thoughts and actions of our clients. Through it we are able to impress, by repetition, on the owner the method of care and treatment and most important of all the nature, possible complications and prognosis or possible outcome of the disease or operation. Which one of us has not had a client come to use from some other veterinarian, with the patient showing a complication of the disease properly treated by the first veterinarian but not completely explained or prognosed? And last but not the least use of patience is to aid us in refraining from making any quick judgments or assuming a snappy or unsympathetic attitude.

In this connection we must not forget the governor of our acts and words—caution. It takes special training to obtain that knowledge and tact which enables one to explain with sufficient definiteness the possible complications to protect himself from a seemingly wrong diagnosis, or to make a good expert witness in the courtroom. We should also be cautious about causing the owner undue alarm. It results in unnecessary worry for the client, which usually reacts against the diagnostician. There is also the danger of the accusation, if not the truth, of

"bleeding the client" or commercializing our science which always lowers our dignity and weakens the confidence of the laity.

To complete fully the development of a diagnostician, I think he must appreciate his relationship and courtesy toward other veterinarians. In our hospital we have the following rules: When a patient comes to us from another veterinarian or hospital, we, in our own minds, are always suspicious of the veracity of the owner. First, ascertain if possible if all past services are paid for. Second, except it be the same as ours, never discuss diagnosis, care or treatment given by the other veterinarian, as told to us by the owner. Third, never perform an autopsy on an animal which has died under another's care, unless in the presence of the attending veterinarian. Extreme caution and tact must be exercised to protect the other veterinarians as well as yourself.

In consulting, a great amount of good can be done if properly conducted. The actions and attitude of the consultant can either strengthen or destroy the confidence of the owner in the attending veterinarian. In my opinion a discussion of the case should not be within the hearing of the owner. And it seems to me that he who accepts a call from the owner, after consulting with the attending veterinarian, has lost all sense of right or sportsmanship.

If my remarks have bored you or seem commonplace, I hope you will forgive me, for these sentiments and facts are the life and pleasure of my work. If they have in any way sharpened your sense of duty to your patient, your client or your fellow veterinarian, my humble efforts are indeed well repaid.

CHANGES IN THE VETERINARY FACULTY OF THE UNIVERSITY OF HABANA

Dr. Julio San Martin has been appointed professor interino of conformation of animals and veterinary law, to succeed the late Dr. H. Lainé. Dr. Lorenzo Martin Perez, formerly assistant to Dr. San Martin in anatomy, has been appointed interino professor of anatomy. Dr. Miguel Rodriguez, a graduate of the Alfort Veterinary School, has been appointed professor interino of sanitary police and meat inspection and Dr. Bernardo Crespo, Chief of the Veterinary and Animal Industry Section of the Department of Agriculture, has been appointed assistant, interino, to Dr. Rodriguez. Dr. Crespo is editor of *Agricultura y Zootecnia*, the leading agricultural and live stock journal of Cuba.

N. S. M.

BACILLARY WHITE DIARRHEA AND THE AGGLUTINATION TEST*

By J. F. OLNEY and OTTO BEDERKE

University of Nebraska, Lincoln, Nebraska

We have in America two diseases of poultry which are of special importance: tuberculosis and bacillary white diarrhea. Since a treatment has not been discovered for these two diseases, we shall have to confine the fight against them to the eradication of the virus carriers. For this purpose, however, we need a good diagnostic method.

In regard to tuberculosis this problem has been successfully solved by the introduction of the tuberculin test. In the case of bacillary white diarrhea, there seems to have been discovered a rather satisfactory method of diagnosis by the introduction of the agglutination test by Jones,¹ in 1913.

As indicated by Hooker,² there seems to be a demand for such a diagnostic method. The agglutination test has been used in scientific investigation and in practice in a large part of the United States. The more attention that was given to this disease the more evident it became that it caused large losses by a reduction in fertility, hatchability and viability, and an increase in the mortality during the first three or four weeks of life, a stunting of the surviving chicks, a reduction in the number of eggs laid, and even the death of the adult fowls from acute and chronic forms of the disease.

In several states (Indiana, Connecticut, Maine, Massachusetts, and perhaps others), the agglutination test was adopted at once as a means of eradicating the virus carriers with reported good results.

In the last few years, however, the value of the test as a practical means of diagnosing the disease has been questioned. Some variations have been found by laboratories testing the same specimens of blood, also that repeated tests of the same flock varied to a considerable extent.

Lack of confidence in the agglutination test found full expression when Beach, Halpin and Lampman,³ of the Wisconsin Experiment Station, in 1926, at the sixty-third annual meeting

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of the American Veterinary Medical Association, declared that the test is not accurate and that they doubted the efficiency of the test as a practical means of eradicating the pullorum infection. Beach and his associates came to this conclusion after an investigation with fifty-six hens which were tested eleven times in thirteen months. The results of this work showed so many variations that most of the birds, they state, could have been considered positive or negative, depending upon the time when the test was made. They also stated that the same samples of blood tested at different laboratories did not agree. From this work they concluded that the poultry industry is better off with no test at all, because of the false sense of security that an inaccurate test implies.

The fact that there are sometimes different results obtained by the agglutination test was well known to the writers. To them the question suggested itself as to how bad these results really are, and if we are justified in depriving the poultry industry of the only weapon of defense against the most deadly infectious disease of baby chicks. That different laboratories obtain different results in testing the same specimens of blood may be a technical fault, which, in the future, may be diminished by a more uniform and finally improved, standard method. The important point to be determined is, whether or not this test, in spite of its many faults, has sufficient value to be recommended to poultrymen for the eradication of the disease, as long as a better method of diagnosis has not yet been discovered. Having the foregoing in mind, the writers were desirous of determining from a considerable number of hens which reacted positively to the agglutination test, the number that could be shown to have the infection by the bacteriological examination of the ovary of each. It was also important to determine the number of infected hens from those which reacted negatively to the test. In making a study of the test to prove or disprove its value, it is also important to observe the results obtained in the field as to the hatchability and viability of the chicks from flocks where the hens reacting to the test have been removed from the flock.

TECHNIC EMPLOYED

It may be of interest to describe the technic employed by the writers.

Blood samples: The blood samples were collected from birds which had been fasted for twenty-four hours. The aspiration

method of obtaining the blood, described by Martin and Olney,⁴ was used.

Antigen: The antigen used in the test was prepared from *Salmonella pullorum* cultures isolated from baby chicks sick with the disease, and selected for their agglutinability. The strain selected answered all the requirements, morphologically and culturally, producing acid and gas in media containing dextrose and mannitol, and negative in media containing lactose, maltose and sucrose. The antigen was prepared by making a suspension of a 48-hour agar culture in physiological salt solution containing 0.5 per cent phenol, and diluted to a density of tube one of McFarland's nephelometer. Two cc of a 2 per cent solution of sodium hydrate was added to prevent cloudiness.

The test: A serum dilution of 1-50 was used. The tubes were incubated for twenty-four hours at 37° C. before reading.

Interpretation of the test: All reactions complete and incomplete were reported as positive on the ground that the flock is of far greater importance than a few individual birds. In each case the flock was given the benefit of any questionable reactions. All reacting fowls were immediately removed from the flock.

For the purpose of the investigation, two flocks, numbering in all about 3500 birds, were used. Of the 3500 fowls tested, 450,

TABLE I—Tests and retests of 3500 fowls for bacillary white diarrhea

(A) Data on fowls tested first time	
Fowls tested	3500
Fowls reacting to the test	450
Per cent reacting	12.8
Fowls examined bacteriologically	209
Fowls from which <i>S. pullorum</i> was isolated from ovaries	121
Fowls showing definite lesions of ovaries	125
Fowls showing very small, diseased or normal ovules with inactive ovaries	84
(B) Fowls giving positive reactions on second test	
Fowls tested second time	112
Fowls reacting positive on second test	89
Fowls from which <i>S. pullorum</i> was isolated from ovaries	98
Fowls giving negative reactions on second test	23
Fowls from which <i>S. pullorum</i> was isolated and which gave negative reactions on second test	9
(C) Fowls giving negative reactions on first test	
Fowls tested second time	75
Fowls from which <i>S. pullorum</i> was isolated	3
Fowl reacting positive on second test	1
Fowls showing gross lesions	5

of 12.8 per cent, were found to react to the agglutination test. One hundred twelve of the reacting birds were tested a second time, with the result that 89 reacted and 23 were negative. Fowls were taken from both negative and positive groups for postmortem examination.

As will be seen in table I, 209 birds were taken from those that reacted to the agglutination test for postmortem examination. Of these 121 were found to be positive infection carriers, *S. pullorum* having been isolated from the ovaries.

Of the 88 birds remaining, there is little doubt that a considerable number may also have been infected. The fact that cultures were not obtained may be explained, first, by a number of cases in which the culture was overgrown with spore-forming organisms; second, by the organism having been killed during sterilization of the surface of the ovule, in case of inactive ovaries where the ovules were very small. Another reason why the infecting organism could not be recovered from the ovary of a reacting hen is that the infection was eliminated, or possibly located in some other part of the body.

As will be seen in table I, 112 fowls reacting to the first test were tested a second time. A month later the second test revealed 89 positive reactors and twenty-three negative. However, from nine of the twenty-three, *S. pullorum* was isolated, leaving but fourteen in question.

In general it can be said that the majority of positive-reacting birds were infection carriers, and that the majority of birds reacting to the first test reacted to the second. It is impossible to say that the reacting birds were free from the infection because *S. pullorum* was not isolated. It is also impossible to say that, because a reacting bird fails to react on a second test, the fowl is not infected, because in nine such cases *S. pullorum* was isolated. It appears that infected birds do not at all times carry sufficient agglutinins in the blood to produce agglutination.

Seventy-five birds showing a negative reaction to the first agglutination test were used as controls. On a second test one was found to be a positive reactor, while *S. pullorum* was isolated from three of the seventy-five. Postmortem examination revealed that five birds had gross lesions of the ovaries. From the foregoing it appears that a large percentage of virus carriers react to the test and that repeated tests are necessary.

SOME FIELD OBSERVATIONS

It is very unfortunate, from an experimental viewpoint, that records of the hatchability and viability were not recorded for one or more years before the flocks were tested. It will be of interest, however, to know, in a general way, the condition that existed. One of the flocks which numbered between 1400 and 1500 laying hens was established about six or seven years ago. The owner states that for the first three years there were practically no losses of baby chicks during the first month, which takes the chick past the most dangerous period of its life, as far as bacillary white diarrhea is concerned. The fourth year (1924) in business, the mortality was noticeable and steadily increased each year until it became quite alarming a year ago (1926).

Table II gives a detailed report of 1500 chicks which were hatched after the flock had been tested and all reactors removed. Of the eggs set, 85 per cent hatched throughout the season of 1927. The hatching capacity was 2000 eggs and the incubators were set four times.

TABLE II—Record of 1500 chicks, hatched 3-11-27

DATE		S. PULLORUM ISOLATED	CULTURES NEGATIVE
March 14	3 chicks dead	1	2
March 16	7 chicks dead	4	3
March 18	7 chicks dead	2	5
March 19	6 chicks dead (4 killed)	3	3
March 20	382 chicks sold, leaving 1096		
March 21	1 accidental death		1
March 21	1 chick dead	1	
March 23	1 chick killed, small and unthrifty		1
March 25	1 chick killed, small and unthrifty		1
March 27	1 chick killed, small and unthrifty		1
March 28	2 chicks killed, small and unthrifty		2
March 30	1 chick killed, small and unthrifty		1
March 31	1 chick killed, small and unthrifty		1
April 2	1 chick killed, small and unthrifty		1
	33 chicks dead or killed	11	22

A history of the other flock regarding hatchability and viability was not obtained. During March and April, 1927, the hatchability was about 80 per cent. A mortality record was kept on 2615 chicks placed in eight lots. Cultures were not made from each chick to determine the presence or absence of infection. The mortalities during the first four weeks were 131, or 5 per cent. These results are very favorable and reported by the manage-

ment to be the best obtained for a number of years. The authors do not wish to give the agglutination test credit for all of the improvement, for each year better methods of hatching and brooding chicks are used. The exact amount of benefit derived from the test can be determined only by a series of well-controlled experiments.

SUMMARY

From the postmortem examination of birds giving positive and negative reactions to the macroscopic agglutination test, it appears that a great majority of infection carriers react to the test. That repeated, yearly tests of breeding stock, together with proper sanitation and a vigorous culling of unthrifty chicks, will control the disease is almost beyond question.

The results obtained by the writers agree with the majority of experimental workers, that the chick viability from tested fowls is high.

REFERENCES

- Jones, F. S.: Further studies on bacillary white diarrhea in young chickens. N. Y. State Vet. Col. Rpt., 1910-11, pp. 68-88.
Hooker, W. A.: Investigations on bacillary white diarrhea infection of fowls. U. S. Dept. of Agr. Report on the Agricultural Experiment Stations, 1925, pp. 95-130.
Beach, B. A., Halpin, J. G., & Lampman, C. E.: Results of bacillary white diarrhea investigations. Jour. A. V. M. A., lxx (1927), n. s. 23 (5), pp. 605-611.
Martin, H. M., & Olney, J. F.: A more refined method for obtaining blood from fowls for serological work. Jour. A. V. M. A., lxx (1927), n. s. 23 (5), pp. 652-655.

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HEREDITARY FACTORS IN DISEASE RESISTANCE*

By E. ROBERTS, *Urbana, Illinois*

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Heredity, the process by which an individual passes on to future generations his characters, lies at the basis of all permanent improvement in animals. This all-powerful factor has been in operation in the building up of every great breed and family, being used consciously or unconsciously by the breeder. Not only has it been responsible for the remarkable accomplishments in animal breeding, but also responsible for many unsuccessful attempts in the field of animal production. It is safe to say that when the laws of heredity are fully understood, including the modes of inheritance of the many individual characteristics, or genes, as they are now called, the breeder may proceed directly toward the goal he has in mind, moulding and patterning a type of animal much as a potter fashions from the plastic clay his works of art.

But that time is not yet, for the science of genetics or heredity is young, having been developed for the most part during the last twenty-five years. However, during this relatively short time much that is fundamental has been learned and daily new discoveries are being made, which increase the general fund of knowledge.

The differences found among animals are of two kinds, one environmental and the other genetic. The environmental differences are of no value for permanent improvement because they are not hereditary; but the genetic differences, since they are hereditary, can be bred in or out of a stock, enabling the breeder to produce the type desired.

Here arises the first problem—to determine which of the existing differences are due to heredity and which to environment.

It is logical that the first characters to be studied should have been those easily followed through successive generations, such as those of color and morphology. Illustrative of the simplicity of some of these characters, let us consider the inheritance of black and red color in cattle. If pure black are crossed to red, the offspring are black; but since one parent was red the crossbreeds are not pure. When the second generation is produced both black and red individuals will be found in the ratio of three blacks to

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one red. One-third of the blacks are pure for black and two-thirds are impure and will produce both black and red offspring. When a red calf is dropped by a registered Angus female mated to an Angus bull, the fact that both sire and dam are impure for color is immediately established.

Unfortunately the most valuable characters in our domestic animals are not such simple characters as color, but are for the most part physiological and invisible, thereby surrounding their study with many difficulties. But being convinced that the same fundamental laws govern the inheritance of all characters, the investigator in this field proceeds with some assurance as he attempts to discover the facts concerning these more complex characters.

In this discussion, our interest lies primarily in the possibility of resistance and susceptibility to disease belonging to the class of hereditary characters.

HEREDITARY DEFECTS

Investigations have shown hemophilia in man, susceptibility to transplantable tumors in mice, scrotal hernia in swine, blindness in cattle (due to a cataractous condition), an epithelial defect in cattle (reported by Dr. F. B. Hadley, of Wisconsin), presence and absence of complement in guinea pigs, hairlessness in rats, and many other defects to be hereditary. All of these characters are probably due to abnormal structure or functioning, and not due to living organisms—not bacterial in origin.

Since diseases resulting from infection are so prevalent and serious in their results, we are interested in the possible existence of hereditary factors contributing to resistance to bacterial infection. With this in mind, the Department of Animal Husbandry began, in 1924, a study of resistance to bacillary white diarrhea in chickens. Several hundred day-old chicks were inoculated with a culture of *Salmonella pullorum*. The few which survived constituted breeding stock for 1925. The survival among their offspring was 49.6 per cent, while among controls the survival was 18.4 per cent. Adding some of the 1925 survivors to the 1924 breeding stock, the tests in 1926 gave 58.2 per cent survival for the selected line and 11.2 per cent for the controls. Similar results were obtained for 1927. The selected stock is composed of two lines, one which has been more or less inbred for twenty-three years and the other not inbred until 1927. In the long-time inbred stock, brother and sister matings had, among

the 1927 offspring, a survival of 76.7 per cent, while in the other line brother-and-sister matings gave a survival of 45.4 per cent. If resistance and susceptibility are hereditary, these results would be expected, since in the long-time inbred line the susceptible individuals would have been eliminated by natural selection operating over the 23-year period, while in the other line, which was first inbred in 1927, the factors for susceptibility were brought to light by the close inbreeding.

In all of the tests the chicks were inoculated with a pure culture of *S. pullorum* by means of a pipette.

From the results of this study involving more than 8,000 individuals one can conclude that heredity is involved in resistance and susceptibility to bacillary white diarrhea. Recently Dr. Manresa, of the University of Wisconsin, reported that he found in rabbits an inherited resistance to infection with the organism of porcine abortion. Also Lambert and Knox, of the Iowa State College, reported work indicating the presence of hereditary factors in fowl typhoid, and Irwin, of the same institution, reported similar results with rats to infection by the Danysz bacillus.

VETERINARIANS CAN HELP GENETICISTS

The positive results of the few investigations upon the inheritance of resistance to disease afford encouragement for undertaking new researches. Pathologists and veterinarians may be of great help in these genetic studies by reporting cases having any possibilities of being influenced by heredity and by giving the geneticist the benefit of their wide experience and training. Only by cooperation can the most be got out of these problems.

In my opinion, ever-increasing attention should be given to the possibility of contributing to the control of disease through the application of heredity in the breeding of animals.

Past procedure in disease control has been largely based upon the assumption that the causes of disease are environmental and that heredity is a negligible or minor factor.

If resistance and susceptibility are hereditary, our present preventive measures in disease control retain the susceptible as well as the resistant individuals. Since the susceptible bear young, the total resistance is being lowered by the retention of individuals which without preventive measures would be eliminated by natural relation. Of course no one would advocate decreasing the energy spent in our present methods of prevention, but should not the possibilities of genetics as a source of aid in controlling the most serious cause of loss in animal production be thoroughly investigated?

SOME OBSERVATIONS REGARDING THE CAT IN HEALTH AND DISEASE

By GERRY B. SCHNELLE, *Boston Mass.*

Angell Memorial Hospital

The following figures, taken from the yearly reports of the Angell Memorial Hospital, show clearly that the cat is an animal worthy of any veterinarian's attention. In the year 1926, 4837 cats were medical or surgical cases, either in the Hospital or the dispensary. Last year there were 2111 hospital cases and 4311 dispensary, or a total of 6422 cats treated, either medically or surgically, during the year 1927. These figures represent quite an investment on the part of the owners. A goodly number of the patients were for major surgical operations.

Without a doubt, the handling of the cat, and diagnosis and treatment of disease is much more difficult than in the dog.

The quickest way to discover whether a person has real "animal sense" or not is to place a frightened, wild-eyed cat in his hands and watch results. If we will but remember at all times that only exceptionally does the cat assume an offensive attitude unless agitated, the handling of such an animal will be much simplified.

Bearing this in mind, in restraining the cat for examination hold it just as gently and loosely as possible and if it struggles do not let your reflexes get the better of you, and tighten your grip—just continue to be as gentle as possible—and the kitty will reward you. Patience, courage, self-control, understanding and love for the animal are the qualities required to get along with the cat and its fond owner.

As we have discovered in the dog, diet plays a part of great importance in the cat hygiene. A varied diet is essential, raw foods are necessary to health and longevity, and the diet is of great importance in treatment of the sick and post-operative patients. Most of us have found to our sorrow that, even following so simple an operation as castration, occasionally one will turn up in four to nine days after operation, vomiting bile and running a temperature up to 104-105° F. and there being no post-operative infection. I will not state that this condition is true infectious enteritis, however closely it may resemble it, but

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I heartily believe that the symptoms are traceable to feeding or at least aggravated by heavy feeding. We have adopted as a routine measure the following instructions:

Feed nothing but milk or broth for three to four days following operations upon your cat. Feed sparingly for the duration of a week.

Since the adoption of this method quite a few months ago, we are no longer troubled with the aforementioned condition.

Before spaying it is well to have the stomach thoroughly empty and $\frac{1}{4}$ to $\frac{1}{2}$ grain of calomel, twelve hours before operation, is of value. Post-operative care is about the same as after castration, except that the light diet should be kept up for ten days following the operation. No doubt most of you gentlemen who do these operations in the home and turn the patient loose after you are through with it, are not troubled with post-operative care to any extent. I contend that if the patient gets his usual exercise there will be no trouble, but if it does not, it is wise to look to its diet.

CESAREAN SECTION IN THE CAT

The cesarean operation can be performed with success upon the cat if done soon enough. Salient points about this operation are to operate quickly, give 2 cc of pituitary extract as soon as you have finished the job, get the mother and her kittens home and keep her on milk and broths for a week. At the Angell Memorial Hospital, Dr. Schneider has performed four cesarean sections and a hyster-o-ophorectomy upon one cat and she is still alive and enjoying good health without having to worry about more kittens. I have done three cesareans and a hyster-o-ophorectomy upon one cat, only to have her die following the latter. All four of these operations were done within a fourteen-months period.

Regarding infectious enteritis, coli-bacillosis, cat typhus or whatever we may call it, as you know, briefly, the history is complete anorexia, vomiting yellow or greenish-hued liquid, and depression to varying degrees. Clinical examination shows pain upon manipulation of the abdomen, temperature from 102-106° F., or subnormal in the last stage, frequent retching, and sometimes bloody diarrhea.

We have reason to believe that infectious enteritis is not very infectious, that only peculiarly susceptible cats will contract the disease when exposed to it. We know that following stormy,

rainy weather, the number of cases is greatly increased. Perhaps this is due to the fact that during such weather most cats are inclined to be listless and not move around much and that the owners feed them as much as ever. I do not know, but I am inclined to believe that this factor is of importance.

Regarding treatment, I think we have tried everything that one might give a cat. Seemingly the best results are obtained from early administration of chlorax. Make up a solution—a dram to an ounce of water—and give two drams of the solution every three hours, continuing for twenty-four hours after vomiting has ceased. In a pinch, zonite may be substituted, using the proportion of two teaspoonsful to a glass of warm water. Do not attempt to force feed unless it be by rectum and offer no food excepting milk or broth for ten days after the onset of the disease.

ABSCESSSES AND OTHER INFECTIONS

Other conditions which we are frequently called upon to treat in the cat, and which require treatment varying from the ordinary, are abscesses and infections in the deeper structures of the limbs and tail. Probably more than 90 per cent of these infections are caused by cat bites, in other words, a penetrating puncture wound. If ever there are conditions calling for *free* incision, these require it.

The abscess is best treated by shaving or at least clipping the hair for a reasonable distance from the edge of the affected area. Incise freely, drain and wash with an antiseptic solution as chlorazene. In 24 hours remove all the skin made apparently lifeless by the undermining infection and it is well to remove some of the skin apparently healthy so that there is no possibility of pockets forming between the skin and the underlying structures. Paint with mercurochrome twice daily until healing is affected.

Deep infections, especially those into bone, are best treated by curettage at the beginning and let the wound heal as an open wound with the aid of mercurochrome.

When there is a history of a choking cough, gagging, usually complete abstinence from food (though not always so), be sure to look into the pharynx, even if ether has to be given to do so, for you will often find a needle there, or in that region.

Have you not sometimes seen a cat with chronic eczema and had a history of an apparently correct diet? That is, raw food being fed? Further questioning in such conditions invariably

discloses that a quantity is being fed that would easily do for two or three or even four cats—and still the kitty has a ravenous appetite. The treatment in these cases is obvious.

No discussion of such a rambling nature as this would be complete without a reference to toxicology. Carbolic acid, creosote, tar, common flea soaps, creolin, naphthol and morphin are all taboo as cat medicine. Salol, iodoform and strychnin should be used with great care, in very small doses.

A few rather queer appearing peculiarities of the cat, which, while of no great importance, sometimes help in treating the cats' owners are as follows:

Manx cats are prone to constipation and when they become constipated, are stiff legged and finally become paralyzed behind.

Three-colored cats are almost always females and when they are males they are sterile.

Black cats are more apt to chase their own tails than are white or colored cats. In reference to the latter, which I learned from Dr. Dailey, a woman wrote in to the doctor asking advice about her cat which had the aforementioned habit. In answer, Dr. Dailey replied that she had a black cat and that the condition could not be improved. The good lady was greatly mystified but wholly pleased by the answer, which was correct.

To sum up—know cats and please your clients.

DOCTOR MOHLER AGAIN HONORED

Dr. John Robbins Mohler, chief of the Bureau of Animal Industry of the United States Department of Agriculture, received the honorary degree of Doctor of Science from the University of Maryland, at the commencement exercises held in Baltimore, June 2. In conferring this honor, Dr. Raymond A. Pearson, president of the University of Maryland, referred to Dr. Mohler as having a record of outstanding service for twenty-one years in the U. S. Bureau of Animal Industry and for more than half of that time as and still filling the position of Chief of that Bureau; protector of public health; leader of great scientific forces; recognized at home and abroad because of research and writings; member of many organizations devoted to the promotion of public health and welfare; supporter of the best in community and nation efforts. This is the third occasion of which Dr. Mohler has received the honorary degree of Doctor of Science. In 1920, he was so honored by Iowa State College, and in 1925, by the University of Pennsylvania, his Alma Mater.

THE AGRICULTURAL APPROPRIATION ACT OF 1929

By JOHN R. MOHLER, *Washington, D. C.*

Chief, Bureau of Animal Industry, U. S. Department of Agriculture

The Act making appropriations for the Department of Agriculture for the coming fiscal year, beginning July 1, which was approved by the President on May 16, includes a total appropriation for the Bureau of Animal Industry of \$14,385,030. This sum includes a number of increases for promotions and for additional work to be carried on by the Bureau, amounting to \$494,965.

Among the increases allowed, there is an item of \$199,680 for promotion of veterinarians in the field; this includes an increase of \$39,760 which the Senate added to the Bill after it passed the House, as described on page 990 of the April, 1928, issue of the JOURNAL of the A. V. M. A. This additional money will make it possible to promote many deserving employees, especially in the lower grades, who, on account of lack of funds, have not been promoted for several years and are badly in need of increases in salary. An item of \$50,000 is provided for investigational work on the cattle grub. This parasite causes losses in the value of hides, in flesh of animals, and in milk-production. The aggregate loss from this pest is tremendous, being estimated at upwards of \$55,000,000 per annum. A further increase of \$40,000 is made in our appropriation to cover additional investigations on animal parasites in the United States. An increase of \$50,000 is provided for extending the meat-inspection service to additional plants, and \$10,000 for the inspection of imported animal casings. The sum of \$20,000 is included in the increase for investigating the disease anaplasmosis. The sum of \$25,000 is included to enable a better and more extended inspection of live stock, while in course of interstate transportation, to determine whether or not the animals are affected with any contagious diseases. Another item provides \$4,185 for eradicating scabies in sheep, principally in Louisiana, Mississippi and Kentucky, where there has been a considerable increase in this disease. The sum of \$10,200 is provided to continue investigations into the cause of bacillary white diarrhea in poultry and methods for controlling this most destructive disease. The sum of \$7,500 is included for turkey-production investigations at the U. S. Range Livestock Experi-

ment Station, located at Miles City, Montana, and \$5,000 to conduct experiments in poultry nutrition at Beltsville, Maryland, in cooperation with Johns Hopkins University. Another sum of \$5,000 is included for the purpose of increasing the facilities of the Poultry Experiment Station at Glendale, Arizona. The sum of \$25,000 is specified to enlarge our abattoir at the Beltsville Farm; also \$20,830 for the construction of a beef cattle barn and necessary equipment, including pens, silos, etc. There is also an item of \$10,070 for the rebuilding of a bridge at the Iberia (La.) Experiment Station, which was destroyed during the Mississippi flood. An additional sum of \$7,500 is included for miscellaneous pathological investigations, which include research work upon various live stock diseases to determine their causes and the best methods of controlling and eradicating them. Likewise \$5,000 is added in order to enable a survey to be made of the extent of loco plants in the Southwest, with the view of formulating a definite method of exterminating this weed in order to abate the serious losses which now occur among live stock from eating it.

With the additional appropriations provided by Congress, the Bureau of Animal Industry hopes to accomplish even greater results than have so far been achieved in its endeavor to better live stock conditions and to aid producers in securing larger returns from the sale of their animals and animal products.

BUREAU TRANSFERS

Dr. Wm. A. Montgomery (McK. '18), from Chicago, Ill., to Reno, Nevada, on meat inspection.

Dr. John Dickson (Chi. '10), from Denver, Colo., to Kansas City, Mo., on meat inspection.

Dr. Emerson J. Cary (McGill '94), from Kansas City, Mo., to So. St. Joseph, Mo., on meat inspection.

Dr. Thomas K. Jones (Chi. '18), from Des Moines, Iowa, to St. Paul, Minn., on tuberculosis eradication.

Dr. Clark W. Olson, Jr. (Ont. '22), from St. Paul, Minn., to Bethesda, Md.
Dr. Willard G. Lockwood, Jr. (Corn. '27), from Buffalo, N. Y., to Bethesda, Md.

Dr. James B. Way (K. C. V. C. '14), from Frankfort, Ky., to Louisville, Ky., on meat inspection.

Dr. Joseph R. Addison, Jr., from Chicago, Ill., to Piqua, Ohio, on meat inspection.

Dr. Thomas M. Powell, Jr. (Ind. '24), from Pittsburgh, Pa., to Columbus, Ohio.

Dr. Michael J. Maloney (U. P. '06), from New York, N. Y., to Philadelphia, Pa., on meat inspection.

Dr. Garritt J. Roosink, Jr., from Philadelphia, Pa., to Houston, Texas, on meat inspection.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

RETAINED PLACENTA*

By O. N. SCHULTZ, Latimer, Iowa

Before giving this case report, I wish to make a few general statements relative to retained placenta. There probably is not any classification of that condition, because I suppose in case of retained placenta there is always a certain amount of adhesion between the chorionic tufts and the cotyledonary crypts. However, there certainly is a great difference in the degree of this adhesion. In some the tufts can be lifted out readily, and in others they remain in the crypts and will come out only by liquefaction or general sloughing.

We have heard much about the handling of this condition; some advocate irrigation, others condemn it and use a powdered antiseptic. As for myself, I use both. If there is anything to wash out, I irrigate, using one of the hypochlorite solutions. If the uterus is paretic and not necrotic, I think much good comes from irrigation, using quite hot water. It seems to stimulate involution. As to the time to treat a case with retained placenta, I think it all depends on the condition. The sooner the placenta can be removed without causing hemorrhage and irritation, the better.

I generally have my clients report soon after the 24-hour period. If a heavy piece of afterbirth is presented, early intervention can likely be taken. If only a thin, stringy piece is presented, we most likely have an adherent case and the treatment is delayed until about the 48-hour period. These adherent cases, with swollen cotyledons, formerly were "bug-bears" to me. I have attempted removal, but I have always felt that removal caused the animal more harm than good. I have left such cases alone and put into the uterus the various uterine capsules, uterine oils, and iodoform, but always when I returned and examined these cases, there would be such a bad mess of necrosis and putrefaction that it was discouraging. "Bip" has considerable

*Presented at the fortieth annual meeting of the Iowa Veterinary Medical Association, Des Moines, January 17-19, 1928.

merits, but it is objectionable to the dairyman, as it taints the milk for about two weeks.

I have found, however, one line of treatment which has been satisfactory, but possibly I have used it in too limited a number of cases for me to draw conclusions. I wish to report on one case which is representative.

The patient was a pure-bred Brown Swiss cow, with a strong vigorous calf at her side. No earlier history of the cow was obtainable, as she had been "shipped in." The case was seen about twelve hours following calving. The owner was pretty much concerned, as this was a valuable and high-producing cow.

The placenta was found tightly adherent, the cotyledons greatly swollen and attempts at removing the tufts caused hemorrhage and much straining. However, enough was loosened to allow quite a heavy piece of membrane to hang through the cervix. Fifteen carbo medicinalis capsules were inserted into the uterus and distributed as evenly as possible throughout the lumen under the membranes. A dose of mixed infection bacterin was injected. (It has always been an undecided question with me as to whether or not the bacterins have any merit. I have used bacterins in small doses or in divided doses, but I never could point my finger to definite results.)

The owner was advised to protect the animal from cold and I would return in about 48 hours. Upon my return I found the cow a little thinner, but with a fair appetite. The owner said she was getting along all right. In the uterus great changes had taken place. It had involuted considerably and the swelling of the cotyledons was greatly reduced. There were left in the uterus only the umbilical cord and a few tufts of cotyledons, with a little lochia. The remnants in the uterus were washed out with a warm hypochlorite solution and during the siphoning the uterine walls would involute nicely around my hand and arm and felt pliable and soft to the touch. A further dose of mixed infection bacterin was injected and a favorable prognosis given.

This cow is now about due to calve. She conceived readily following retention of the afterbirth and lived up to her reputation of being a high producer. I mentioned earlier in this report that possibly I had treated too few cases to draw definite conclusions. I have treated only five cases, but with identical results, and I am reporting on the method only for what it might be worth.

TUBERCULOUS EPIDIDYMO-ORCHITIS IN A BOAR*

By FRANK P. MATHEWS, *Lafayette, Ind.*

Department of Veterinary Science, Purdue University Agricultural Experiment Station

History: This case occurred in a pure-bred Poland China boar about two and one-half years old. The animal was purchased and satisfactorily used for breeding purposes during the winter of 1926. During the early winter of 1927, seven sows, which were

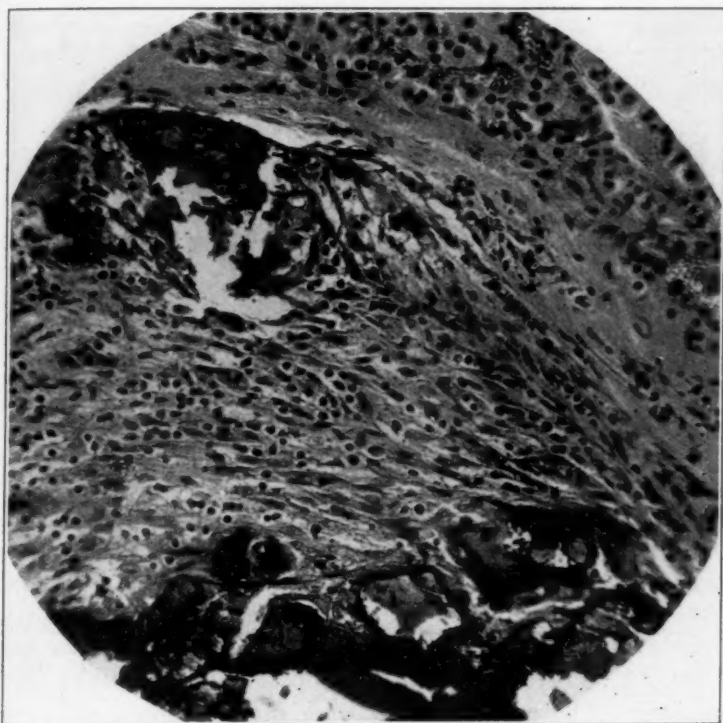


FIG. 1. Photomicrograph of section from boar's testicle, showing the typical granulation and calcification of tuberculous.

served by this boar, either aborted or failed to conceive. The remainder of the sows in the herd were served by a second boar with no unfavorable results. The seven sows served by the first boar were sold for slaughter and the remainder of the herd tested for infectious abortion. One sow reacted but this individual as

*Presented to the laboratory by Dr. F. W. Graves, of Wolcott, Ind.

well as the rest of the sows have since passed through normal gestation periods. The attending veterinarian castrated the boar in question and presented the testicles to the laboratory for examination.

Gross examination: The testicles were equal in size and showed considerable atrophy. Well-defined lesions were readily observed in the epididymis beneath the tunica vaginalis propria. Less conspicuous lesions were also observed in the testicles beneath the tunica albuginea. Longitudinal sections through the testicles and epididymis disclosed numerous caseo-necrotic areas, which varied from a few millimeters to two or three centimeters in



FIG. 2. A testicle and epididymis, showing caseo-necrotic areas (A).

diameter. The necrotic areas were sharply circumscribed and enclosed within a thin but definite fibrous wall. There was some calcification present.

Bacteriological examination: Smears were made from the necrotic areas and stained by Ziehl-Neelson's method, but acid-fast bacteria were not found. Pork-infusion agar, to which blood and serum had been added, was seeded with the necrotic material, but no growth developed for a period of ten days. Guinea pigs were inoculated with the necrotic material, and were killed three months after the inoculation. There were no lesions found upon

autopsy, and the sera of the guinea pigs gave negative results with the agglutination test for infecticus abortion.

Microscopic examination: The caseo-necrotic areas were found upon microscopic examination to be surrounded by a zone of endothelioid cells. Many round cells were intermingled with the endothelioid cells. A well-defined capsule surrounded all lesions which exhibited a marked degree of necrosis. Foreign-body giant-cells and calcium deposits were quite abundant. In addition to the older lesions there were many miliary lesions composed of round cells scattered between and around a few endothelioid cells. The miliary lesions showed slight evidence of necrosis and had stimulated but little fibroblastic response. The convoluted seminiferous tubules were much decreased in size and there was no evidence of spermatogenesis. The epithelium of the convoluted tubules was practically destroyed. A few epithelial cells were still present but were irregularly distributed and showed either pyknosis or karyorrhexis. Sections stained for the presence of acid-fast organisms showed an occasional organism of this type. These organisms had a beaded appearance and were found in the miliary lesions but not in the older lesions in which necrosis had occurred.

Diagnosis: The fact that acid-fast organisms were demonstrated only in the miliary lesions, and that the experimental inoculations were made with material from the old necrotic lesions, suggests the possibility that the guinea pigs did not receive a sufficient dose of the tubercle bacilli to produce the disease. The microscopic changes in both the testicles and epididymis were indistinguishable from those caused by *Mycobacterium tuberculosis*, and since acid-fast organisms were found in the miliary lesions, a diagnosis of tuberculous epididymo-orchitis appeared to be justified in this case.

Minneapolis, the Youngest City of Its Size in the World

A TWO-LEGGED DOG

By S. E. HERSHEY, Charleston, W. Va.

I was very much interested in the report of Dr. P. W. Horner, of Elkhart, Ind., concerning his two-legged dog, in *Veterinary Medicine* for April, 1926. The accompanying photograph of another two-legged dog shows that we in West Virginia can do

as well as Indiana in the way of freaks. This is a half-breed bull terrier, the other side being a general Duke's mixture. This fellow is 18 months old and is always ready for a play with another dog. He stands alone and is just real dog. He was one of his mother's third litter, the first and second litters consisting of five and seven normal puppies. The fourth litter, which arrived two months ago, consisted of three normal puppies and



Put down two, carry naught.

two just like the above, a male and a female. They were sired by the same sire. This puppy, at the age of seven months, suffered an attack of meningo-encephalitis (frights disease), so common in our locality the past two years. Since then he has just been real dog as usual and having a good time. The diet consists of table scraps, with some "Fibro ThoroBred" and corn bread for a change, with very little meat.

Minneapolis, the Breadbasket of the World

REVIEWS

FUR-FARMING FOR PROFIT. Frank G. Ashbrook. In charge, Division of Fur Resources, Bureau of Biological Survey, U. S. Department of Agriculture. xxiii + 300 pages, with 127 figures in the text. The MacMillan Co., New York, 1928. Cloth, \$4.00.

This book is the latest addition to the Rural Science Series, edited by Dr. L. H. Bailey. It covers the subject of fur-farming in all its details. The author's first-hand experience in this field, with the observations that he has been able to make in all phases of the industry, eminently qualify him to write upon the subject.

The book is divided into ten chapters. These deal with the nature and present status of fur-farming, geographical distribution of the industry, recommendations for the beginner, fox-farming, raising fur animals other than the fox, transportation of live animals, pelting, marketing pelts, hygiene and legal aspects of fur-farming.

One of the shortest chapters in the book is that devoted to hygiene. A trifle over four pages is given to the subject. The section headed, "Treatment of Disease," occupies less than a page. The brief treatment of this subject does not seem to indicate any belief upon the part of the author that the subject is lacking in importance. On the other hand, it appears to have been his opinion that further elaboration of the subject was not indicated in a book of this kind.

The following significant statement is made: "Insuring sanitation and preventing disease are a function for the fur-farmer, but for the treatment of disease the services of a competent veterinarian or specialist should be obtained. The diagnosis of disease and the administration of potent drugs call for special training and experience, and the fur-farmer who undertakes unaided the role of veterinarian is likely to come to grief."

One would be justified in thinking that the author has been favorably impressed by those veterinarians with whom he has come in contact. Veterinarians should cherish and guard zealously such confidence in the profession as this prominent authority shows. His book should be read by every member of the

veterinary profession. It is as interesting and informative as it is stimulating and refreshing.

Minneapolis, the Financial, Wholesaling, Jobbing, Retailing, Manufacturing, Distributing, Educational, Cultural Metropolis of the Northwest

FILTERABLE VIRUSES. Edited by Thomas M. Rivers. ix + 414 pages, with 27 illustrations. Wilkins and Wilkins, Baltimore, 1928. Cloth, \$7.50.

Ten discussions of filtrable viruses are presented in this book, each by a recognized authority. A vast amount of work has been done with this interesting group of infectious agents and the collaborating authors have discussed in one volume some of the chief problems confronting investigators in this field of work.

In order, the following phases of the subject are discussed: General aspects of filtrable viruses, filters and filtration, tissue cultures in the study of viruses, intracellular pathology in virus diseases, virus disease of man as exemplified by poliomyelitis, virus diseases of mammals as exemplified by foot-and-mouth disease and vesicular stomatitis, virus diseases of fowls as exemplified by contagious epithelioma (fowl-pox) of chickens and pigeons, virus diseases of insects, and virus diseases of bacteria—bacteriophage.

The word "filterable" is used throughout the book, on account of wide usage for many years, although the editor acknowledges that "filtrable" is etymologically correct. Exhaustive bibliographies are appended to all chapters. The fact that the bibliography on bacteriophage contains 225 titles will give some indication of the amount of work already done and reported in connection with this interesting phenomenon within the past few years. D'Herelle published his first description in 1917, although Twort (1915) undoubtedly observed the phenomenon several years earlier.

Although every chapter in the book is full of interesting information, in those devoted to foot-and-mouth disease, vesicular stomatitis and contagious epithelioma will be found the strongest appeals to veterinarians.

Minneapolis, the Gateway to the Ten Thousand Lakes Region

ABSTRACT

STUDIES ON THE BLACK TONGUE PREVENTIVE IN YEAST. Joseph Goldberger, G. A. Wheeler, R. D. Lillie and L. M. Rogers. U. S. Public Health Reports, xliii (Mar. 23, 1928), 12, pp. 657-689.

In previous work the authors pointed out the similarity of experimental black tongue of dogs to human pellagra, a view supported by the suggestion of a common etiology indicated by the successful production of black tongue in the dog by feeding pellagra-producing diets. The report of further results of the same study was included in the present paper.

The results obtained following experiments with the diets producing black tongue led to the conclusion that the experimental black tongue of dogs was due to a deficiency in diet and that yeast contained something which was capable of correcting this deficiency.

This black-tongue preventive in yeast was inactivated or destroyed by heat sufficient to char the yeast, but retained its preventive potency in large measure, if not entirely, after being heated in a steam autoclave at 15 pounds pressure for seven and one-half hours. It was absorbed by English fuller's earth from an acidulated aqueous extract of either dried yeast or of yeast first autoclaved at 15 pounds for two and one-half hours. It cannot be identified with any of the older well-recognized dietary essentials and appears to be identical to the thermostable substance in yeast reported by Smith and Hendrick.

The results of this work strengthen the belief that the black-tongue preventive and the pellagra preventive (vitamin P-P) are identical.

S. S.

Minneapolis, the City of Lakes

DOCTOR ROBERTS ON SABBATICAL LEAVE

A letter received from Dr. G. A. Roberts, of Lavras, Minas, Brazil, stated that he and Mrs. Roberts were scheduled to leave Brazil about the middle of June and would go direct to Oregon, Holt County, Missouri, where the parents of Dr. Roberts are planning a family reunion during the month of July. Dr. and Mrs. Roberts are taking their sabbatical year and their friends may address them, while in this country, at Oregon, Mo.

ARMY VETERINARY SERVICE

CHANGES RELATIVE TO VETERINARY OFFICERS

No change in duty status of regular personnel.

Reserve Corps

New Acceptances

Hanneman, Walter H.	Capt.	2619 Everett Ave., Kansas City, Kan.
Reinhardt, Robert R.	Capt.	Lincolnton, N. C.
Speaker, Jesse P.	2nd Lt.	Tallah, La.

Separations

Andress, Wm. R.	1st Lt.	Died April 19, 1928.
Dill, David M.	2nd Lt.	Failed to accept reappointment.
Mattingly, Irvan C.	2nd Lt.	Failed to accept reappointment.
Meyer, Oliver A.	Capt.	Appointment terminated.
Mitchell, James C.	1st Lt.	Failed to accept reappointment.
Roberts, Henry P.	2nd Lt.	Failed to accept reappointment.
Russell, Fay F.	1st Lt.	Failed to accept reappointment.
Schattenburg, A. E.	2nd Lt.	Failed to accept reappointment.

Promotions

Doherty, Patrick J., to	Capt.	3046 Newton St., Denver, Colo.
Lash, Cleo L., to	Capt.	1837 Hickory St., Oklahoma City, Okla.
Chappell, Robert F., to	1st Lt.	Navasota, Texas
Broad, Fay E., to	1st Lt.	802 N. Michigan, Plymouth, Ind.
Kucher, Paul C., to	Capt.	829 W. Jefferson St., Ft. Wayne, Ind.

Transferred

Stephens, George	Capt.	White River Junction, Vt. Trans. to Aux-Reserve.
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Minneapolis, the Gateway to the Ten Thousand Lakes Region

ORDERED TO FORT SNELLING

The following Veterinary Reserve Officers, located in the Seventh Corps Area, have been ordered to Fort Snelling, Minnesota, for summer training, July 2, 1928:

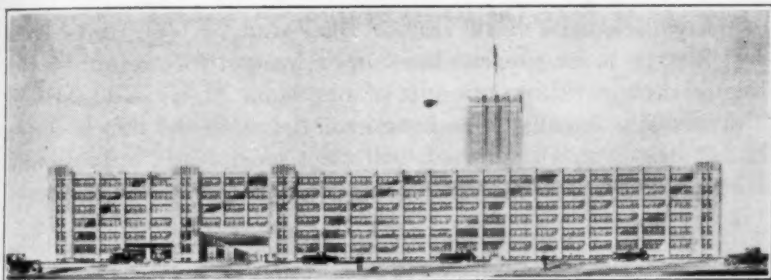
Anthony Joseph Matter	1st Lt.	Crystal, N. Dak.
Edwin Frank Kallenberg	Capt.	Cedar Rapids, Iowa
Ralph Albert Moye	Capt.	Manchester, Iowa
Albert Clyde Barr	Capt.	Kansas City, Mo.
Frank Arthur Bonnstetter	2nd Lt.	St. Paul, Minn.
Clyde Wilton Picht	2nd Lt.	St. Paul, Minn.
Hubert Jesse Harmer	2nd Lt.	Council Bluffs, Iowa
David Harkay Bibens	1st Lt.	Kincaid, Kans.
Godfrey Charles Bevan	Capt.	Washington, Iowa
John Arthur Patton	1st Lt.	Marysville, Kans.
Louis Earl Willey	Capt.	Sioux City, Iowa
Elmer Nelson Davis	1st Lt.	Fort Scott, Kans.
Lester Ray Smith	Lt. Col.	Sioux City, Iowa
LeRoy Emery Dietrich	1st Lt.	Wichita, Kans.
Melvin Leonard Dietrich	1st Lt.	Newton, Kans.

MISCELLANEOUS

NEW BUILDING FOR PARKE, DAVIS & COMPANY

A new building, more than 600 feet long and six stories high, will be added to the Detroit laboratories of Parke, Davis & Company, according to an announcement recently made public.

This structure, shown in the accompanying sketch, which will be devoted to manufacturing, will embody the latest improvements in factory construction and design. It will be of reinforced



New building for Park, Davis and Company

concrete throughout, with every provision made for the health and convenience of the employees. The exterior of the building will be faced with brick to correspond with that of the Administration Building which was completed last year.

The new building will be constructed in three units and it is expected that the first unit will be ready for occupancy on January 1, 1929.

Minneapolis, the City of Lakes

ACADEMIC HONORS FOR DOCTOR BLAIR

Again our profession is called upon to recognize and gratefully acclaim the signal honor which McGill University recently bestowed upon one of her distinguished veterinary graduates, Dr. Wm. Reid Blair, of New York City.

On May 30, at the convocation of that University, the honorary degree of Doctor of Laws was bestowed upon five candidates of international distinction: Dr. Canon Cody, formerly Minister of Education for the Province of Ontario, and chairman of the Board of Governors, University of Toronto; Sir Wilfred T. Gren-

fell, humanitarian of Labrador; George Ilse, literateur and author; Julian C. Smith, vice-president of the Shewanigan Water and Power Company of Canada; and Dr. Wm. Reid Blair, class of 1902, faculty of comparative medicine, whose name was presented to the Chancellor in the following words:

Dr. Wm. Reid Blair, a distinguished graduate of this University; veterinarian and pathologist; Professor of Comparative Anatomy, New York University; Director of the New York Zoological Park, New York City; Chief Veterinary Officer, 4th Army Corps, American Expeditionary Forces in France; an author, an excellent teacher and in his science a master mind who has devoted his life to the improvement of methods for the humane care and treatment of animals, and the protection and conservation of bird life.

We congratulate both Doctor Blair and McGill University. Dr. Blair is to be congratulated upon his worthily receiving the highest honors within the gift of his Alma Mater, and McGill University is equally to be congratulated upon the happy terms of her bestowal, all of which will meet most ready approbation throughout the entire veterinary world.

F. H. M.

Minneapolis, the Gateway to the Ten Thousand Lakes Region

A NOVEL EXHIBIT

Dr. I. K. Atherton, of Sanitation Boulevard, College Park, Maryland, has kindly supplied the accompanying photograph



Model Hog Farm.

of a novel exhibit, which was arranged for Farmer's Day at the University of Maryland, May 26, 1928.

The exhibit represents a model hog farm. Leading to the farm is a lane, known as "Avenue of Infection." Three wolves are shown in the lane, representing the factors responsible for starting new outbreaks of hog cholera. These are "Infected Pork," "Infected Hogs," and "Abuse of the Double Treatment." A cannon located at the entrance to the hog-yard represents sanitation. It is a typically Athertonesque idea.

DOCTOR YOUNGBERG BOUND FOR U. S.

Dr. Stanton Youngberg, director of the Bureau of Agriculture, Manila, Philippine Islands, accompanied by Mrs. Youngberg, sailed May 3, for Antwerp, Belgium, on the motorship "Tenerifa." They will visit Belgium, Holland, part of Great Britain, and Northern France. August 7, they will sail for Havre from



DR. STANTON YOUNGBERG

Havana, Cuba, and expect to arrive in the United States the last week in August. Communications may be addressed to Dr. Youngberg, while he is in the United States, in care of Mr. E. N. Coberly, Route No. 3, Grove City, Ohio.

COMMENCEMENTS

ALABAMA POLYTECHNIC INSTITUTE

The commencement exercises of the Alabama Polytechnic Institute were held May 22, 1928. In the College of Veterinary Medicine the following graduates received the degree of Doctor of Veterinary Medicine:

N. D. Bradshaw
G. C. Kendall

J. A. Lynn
J. M. Wingate

Minneapolis, the Financial, Wholesaling, Jobbing, Retailing, Manufacturing, Distributing, Educational, Cultural Metropolis of the Northwest

KANSAS STATE AGRICULTURAL COLLEGE

The sixty-fifth annual commencement exercises of the Kansas State Agricultural College were held at Manhattan, May 31, 1928. In the Division of Veterinary Medicine the degree of Doctor of Veterinary Medicine was conferred upon the following:

Robert Stuart Bishop
William Arthur Browne
Robert Ambrose Brunson
Floyd Eugene Carroll
Clait Jennings Doty
Glen LeRoy Dunlap
Daniel Peter Ehlers
Robert Lovell Elsea
George Dewey Huston

Albert Ernest Lauts
Roy Lewis McConnell
John Norris McIlhenny
Theodore A. Newlin
Vilo Thoranton Rose
Albert Irving Schmidt
John David Shoeman
Louis H. Smith
Jack Harvey Spurlock

The following graduates received commissions as second lieutenants in the Officers' Reserve Corps of the United States Army:

Floyd Eugene Carroll
Glen LeRoy Dunlap
Daniel Peter Ehlers
Robert Lovell Elsea
Albert Ernest Lauts
John Norris McIlhenny

Theodore A. Newlin
Vilo Thoranton Rose
Albert Irving Schmidt
John David Shoeman
Louis Harrison Smith
Jack Harvey Spurlock

Roy Lewis McConnell and Glen LeRoy Dunlap were the honor students in the Division of Veterinary Medicine.

***Minneapolis, the Gateway to the
Ten Thousand Lakes Region***

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS

At the commencement exercises of the Agricultural and Mechanical College of Texas, held June 5, 1928, the degree of Doctor of Veterinary Medicine was conferred upon the following:

H. R. Ellis

T. A. Ward

Minneapolis, by the Waters of Minnetonka

COLORADO AGRICULTURAL COLLEGE

The commencement exercises of the Colorado Agricultural College were held in the college gymnasium, June 7, 1928. The baccalaureate address was given the previous Sunday, by Rev. Martin E. Anderson, D. D., of the Central Presbyterian Church, of Denver. The commencement address was given by Mr. John F. Keating, D. Ed., Superintendent of Schools, Pueblo, Colo.

In the Division of Veterinary Medicine the following graduates received the degree of Doctor of Veterinary Medicine:

Grant A. Ackerman
John W. Childs
Fred J. Christensen
Tom Evans
Frank D. McKenney
David E. Madsen

Lawrence W. Neely
T. Robert Phelps
Fay G. Rankin
Warren E. Rasmussen
Fred E. Reddert
Hilton A. Smith

Dr. Hilton A. Smith, of the Division of Veterinary Medicine, received the scholarship honors out of a senior class of nearly two hundred. Dr. Smith also received a commission as second lieutenant in the Officers' Reserve Corps.

Minneapolis, City of Sky Blue Waters

OHIO STATE UNIVERSITY

The fifty-first annual commencement exercises of the Ohio State University were held in the stadium, Monday evening, June 11, 1928. Of the 1260 degrees granted, thirteen were in veterinary medicine. The annual address was delivered by President Emeritus William Oxley Thompson, D. D., LL. D., who, for nearly twenty-six years, had been president of the University. Approximately 8000 people attended the exercises.

The College of Veterinary Medicine presented the following candidates for the degree of Doctor of Veterinary Medicine:

Charles Henry Bowyer
Carl Eddrie Chase

Edwin Perry Kleeman
Carl Libby Martin

John Leverton Cox
Theodore Clinton Fitzgerald
George Dewey Grossman
Ronald Lester Hectorne

Joseph Ralph Robb
George F. Scheetz
Owen Ellis Thomas
Arvo T. Thompson

Virgil Hester Fondren

Minneapolis, City of Lakes and Gardens

IOWA STATE COLLEGE

The commencement exercises of the Iowa State College, held on June 11, 1928, were preceded by an Honors Day program in which the Division of Veterinary Medicine took an active part.

Walter H. Chivers, a senior veterinary student, was the honor man of the entire institution, as well as having the highest average in the Division of Veterinary Medicine. By virtue of being the best student in the Division of Veterinary Medicine, he received the George Judisch prize, which has a cash value of \$25.00 and is sufficient to cover the initiation fee in the American Veterinary Medical Association and dues for three years, including subscription to the JOURNAL. He also received a beautiful silver piece as a prize given by the local Alumni Association. Three senior students, Walter H. Chivers, Russell McNellis and Louis Schwarte, together with Dr. H. C. H. Kernkamp, who has been pursuing graduate work in the College, were elected to Phi Kappa Phi, honorary scholastic fraternity.

Dr. H. E. Biester was elected a member of the honorary fraternity Sigma Xi, and, for the first time, the Gamma Sigma Delta, honorary agricultural fraternity, recognized the Division of Veterinary Medicine. It elected Dr. C. H. Stange, Dean of Veterinary Medicine, Walter H. Chivers, Russell McNellis and Louis Schwarte to membership.

The following graduates received the degree of Doctor of Veterinary Medicine:

William Andrews
Kenneth Bullis
Walter Chivers
Clay Collins
Ben Criley
Lloyd Darst
H. Robt. Ellerman

Chris Jorgensen
Russell McNellis
Orley Mayfield
Vernon Overman
John A. Roberts
Forest F. Smith
Louis Schwarte

Dale Glascock

Dr. Walter H. Chivers will remain at the College next year as house surgeon.

Minneapolis, the Metropolis of the Northwest

STATE COLLEGE OF WASHINGTON

The commencement exercises of the State College of Washington were held, June 11, 1928. Seven graduates from the College of Veterinary Medicine received the degrees of Bachelor of Science in Veterinary Medicine and Doctor of Veterinary Medicine:

Charles A. Bottorff
Allan K. Brown
Frank Thomas Harris

John William Wolfenden

Henry R. Hoon
John Shortreed Murray
James A. Porter

Minneapolis, the 1928 Convention City

CORNELL UNIVERSITY

The annual commencement exercises at Cornell University were held, June 18, 1928. The degree of Doctor of Veterinary Medicine was conferred upon the following:

Charles Joseph Goubeaud
John Ernest Greenway
Kenneth Franklin Hilbert
George Henry Hopson
Wayne Arthur Kelly
Myrtle Fober Lee
John Pierce McIntosh

Robert Stuart MacKellar
Lykergus William Messer
Rudolph Edward Nichols
Cyril James Noonan
Charles Jonas Parshall
Philip Poley
William Ernest Ulmer

The following prizes were awarded for the academic year 1927-1928:

The Horace K. White Prizes:

First Prize.....Wayne Arthur Kelly
Second Prize.....Charles J. Parshall

The Hollingworth Honorarium. Wayne Arthur Kelly

The Jane Miller Prizes:

First Prize.....Lemuel W. Woodward
Second Prize.....Samuel A. Johnson

The James Gordon Bennett Prize Lykergus W. Messer

The Anne Besse Prize.....George Henry Hopson

Minneapolis, America's Vacation City

UNIVERSITY OF PENNSYLVANIA

At the commencement exercises of the University of Pennsylvania, held June 20, 1928, the degree of Doctor of Veterinary Medicine was conferred upon the following:

Haim Appelbaum	Claude William Miller
Alan Bachrach	Ernest William Rackley
Russell Sidney Beardslee	Warren Baker Rawlings
John Dengler Beck	Taylor Prescott Rowe
Lee McDowell Esh	John Hubley Schall
John Bertram Hagenbuch, Jr.	Charles Frederick Starke
Maurice Wendell Hale	Clarence Marshall Stevens
Charles Edward Hutt	Melvin LeRoy Sweigard
Claude Leroy Lamme	Harry Hayward Taylor
William Edgar Martindale	Edwin Downing Tuckerman
Joseph Ambler Shoemaker Miller	Joseph Aloysius Mehan

This is the largest class graduated since 1918.

The J. B. Lippincott Prize of \$100 for the highest general average for the entire four years of the course was awarded to Maurice W. Hale.

The T. E. Munce Prize of \$25 for the highest general average in the courses in Animal Industry was awarded to Maurice W. Hale.

The Jeannette Blair Prize of \$50 for the best work in the Small Animal Clinic was awarded to John D. Beck.

***Minneapolis, the Gateway to the
Ten Thousand Lakes Region***

ON THE WAY TO MINNEAPOLIS



Davenport Hotel, Spokane, Wash.

ASSOCIATION MEETINGS

SOUTHEASTERN STATES VETERINARY MEDICAL ASSOCIATION

The twelfth annual meeting of the Southeastern States Veterinary Medical Association was held at the Washington Hotel, Jacksonville, Fla., February 13-14, 1928. The attendance was unusually large, probably influenced by the location of the meeting and the attractiveness of the program, together with the fact that the Florida State Veterinary Medical Association also met for the annual meeting at the same time and place.

Dr. A. G. G. Richardson, of Athens, Ga., presided. The address of welcome was delivered by Hon. John T. Alsop, Jr., mayor of Jacksonville. Mr. Alsop is a very versatile speaker and his welcome to Jacksonville will be remembered for quite a long time by those whose privilege it was to receive it. Dr. W. K. Lewis, state veterinarian of South Carolina, ably made the response to Mayor Alsop's welcoming address.

In his presidential address, Dr. Richardson told the gathering that the public in general is beginning to realize and appreciate the position of the veterinary profession in its relation to the control of diseases of live stock and to the inspection of meat-food products. He recited the activities of the Association during the past year.

Owing to the inability of Dr. Reuben Hilty, president of the American Veterinary Medical Association, to be present, Dr. H. Preston Hoskins, secretary-editor, brought greetings from the national association. He briefly reviewed the expanding activities of the A. V. M. A. and told what was being done by the various officers and committees of the Association to bring about improved conditions generally for all branches of the veterinary profession. Dr. Hoskins stated that it was his opinion that the outlook for the profession was never brighter and that it looked like a very opportune time for the right kind of young men to take up the study of veterinary medicine as their life work. He gave figures to support his belief that the country is threatened with a shortage of graduate veterinarians unless the enrollment in our veterinary colleges shows a marked increase during the next few years.

The program was divided into seven lecture and questionnaire periods, each one in charge of a competent leader. Dr. F. W. Morgan, of Chattanooga, Tenn., was in charge of "Horse Practice." Before getting very deeply into his subject, Dr. Morgan made a few remarks to emphasize the importance of practicing veterinarians affiliating with all local civic activities. During this period, Dr. C. R. Jolly, of Atlanta, Ga., brought up the discussion of the condition among horses that has existed in some of the stockyards in the southeastern states for some time past. This condition is found among horses that have been shipped some distance on the railroads. Discussion of the disease brought out the fact that it undoubtedly was the same pathological condition reported upon by Dr. Robert Graham and several associates, about ten years ago, having been designated a peracute disease of horses and mules, for want of a specific name, at that time. It was believed that the disease was in some way caused by members of the paratyphoid-enteritidis group of organisms. A very interesting discussion followed.

Dr. W. A. Barnett, of Greenwood, S. C., was in charge of the lecture and questionnaire period on "Cattle Practice." The two diseases which received the most attention during this period were anaplasmosis and botulism. Dr. A. D. Knowles, of Kelsey City, Fla., explained at considerable length his findings in connection with anaplasmosis of cattle on several Florida ranches.

Dr. J. L. Ruble, of Quitman, Ga., was in charge of the period devoted to "Swine Practice." Dr. E. M. Nighbert, of the U. S. Bureau of Animal Industry, explained the work which is being done in the field of swine sanitation, with particular reference to the control of roundworms and kidney worms in swine. Dr. U. G. Houck presented a new moving-picture film from the Department of Agriculture, entitled, "This Little Pig Went to Market." Dr. Houck also read a very interesting paper covering the most important diseases of swine, with particular reference to hog cholera and serum-virus immunization.

Dr. W. M. Bell, of Nashville, Tenn., very ably handled the period devoted to "Small Animal Practice" in place of Dr. M. Jacob, of Knoxville, Tenn., who was unable to be present. The lecture and questionnaire period devoted to the "Diseases of Poultry" was handled by Dr. A. L. Shealy, of Gainesville, Fla.

The evening of the first day, a banquet was served in the main dining-room of the hotel, at which Dr. J. V. Knapp, of Tallahassee, acted as toastmaster.

The afternoon of the second day was given over to the "State Veterinarians" with Dr. Wm. Moore, of North Carolina, in the chair. At this session plans were discussed for the formation of an organization to be known as the Southeastern States Live Stock Sanitary Association. Dr. W. K. Lewis explained the proposal.

Chattanooga was selected as the meeting place for the 1929 meeting. The election of officers resulted as follows: President, Dr. J. V. Knapp, Tallahassee, Fla.; first vice-president, Dr. F. E. Kitchen, Greenville, S. C.; second vice-president, Dr. W. B. Lincoln, Nashville, Tenn.; third vice-president, Dr. C. R. Jolly, Atlanta, Ga.; secretary-treasurer, Dr. John I. Handley, Atlanta, Ga.

Among the veterinarians present who had traveled considerable distances to attend the meeting were: Dr. John R. Mohler, chief of the Bureau of Animal Industry, Washington, D. C.; Dr. H. J. Shore, laboratory director, Fort Dodge Serum Company, Fort Dodge, Iowa; Dr. W. M. MacKellar, chief of the Tick Eradication Division, Bureau of Animal Industry, and Dr. J. F. Devine, of Goshen, N. Y.

Minneapolis, City of Lakes and Gardens

NORTHWESTERN OHIO VETERINARY MEDICAL ASSOCIATION

The twentieth annual meeting of the Northwestern Ohio Veterinary Medical Association was held at the Hotel Secor, Toledo, February 29, 1928. More than one hundred veterinarians were in attendance, including a number from Pennsylvania, Michigan and Indiana.

The first paper on the program was presented by Dr. Alvin Broerman, of Reynoldsburg, entitled, "Recent Observations in Pullorin Testing." Dr. John W. Jackman, of Columbus, presented "Canine Practice." Dr. D. M. Swinehart, of Columbus, president of the Ohio State Veterinary Medical Association, spoke on a number of the more important conditions having to do with the welfare of the veterinary profession. Dr. H. K. Wright, Chief Veterinarian, H. K. Mulford Company, Philadelphia, Pa., presented a very interesting discussion of "Johnes Disease." This was illustrated with lantern-slides and a very interesting discussion followed. In the absence of Dr. F. A.

Zimmer, of Columbus, state veterinarian of Ohio, Dr. H. W. Feldwish read a paper that had been prepared by Dr. Zimmer, entitled, "Veterinary Service and the Various Agencies Restricting Such Service." Dr. Reuben Hilty, of Toledo, president of the American Veterinary Medical Association, delivered a short address dealing with some of the more important activities of the national organization. The concluding number on the program was a question-box, conducted by Dr. J. H. Lenfestey, of Lyons.

Minneapolis, City of Sky Blue Waters

ILLINOIS-MISSOURI VETERINARY ASSOCIATION

The annual meeting of the Illinois-Missouri Veterinary Association was held at Edwardsville, Ill., March 22, 1928.

Dr. William Robinson, superintendent of the Department of Animal Industry, Springfield, Ill., addressed the meeting on the subject of "Animal Diseases Transmitted to Man." "Small Animal Practice" was presented by Dr. H. R. Schwarze, of East St. Louis, Ill. Dr. S. W. Haigler, of St. Louis, Mo., spoke on "Sterility," and Dr. H. Schlesinger, of New Athens, Ill., spoke on "Tuberculin Testing in Poultry." This subject was also discussed by Dr. A. A. Moore, of Edwardsville and Dr. Wm. R. Michael, of Highland, Ill.

An election of officers resulted as follows: President, Dr. Walter Hoehner, Belleville, Ill.; secretary, Dr. J. T. Brown, Belleville, Ill.; treasurer, Dr. F. Beckman, East St. Louis, Ill.; Board of Censors, Dr. J. T. Jennemann, St. Louis, Mo., and Dr. H. Kyle, Highland, Ill.

***Minneapolis, the Gateway to the
Ten Thousand Lakes Region***

**EAST TENNESSEE VETERINARY MEDICAL
ASSOCIATION**

Dr. J. F. Kagey, of Kingsport, Tenn., entertained the East Tennessee Veterinary Medical Association at his office, April 14, 1928. Following the business meeting at the office, the party was entertained at dinner at the home of Dr. Kagey. Covers were laid for fifteen. Mr. Frank L. Cloud, City Manager, was a guest of the Association.

MICHIGAN-OHIO VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Michigan-Ohio Veterinary Medical Association was held at the Court House, Adrian, Mich., April 26, 1928.

The program was in the form of a question-box, divided into four sections. Dr. Reuben Hilty, of Toledo, Ohio, conducted the Section on Small Animals. Drs. H. J. Seaman, of Wauseon, Ohio, and A. H. DeGroot, of Dundee, Mich., handled poultry. Drs. E. T. Hallman, of Michigan State College, and E. B. Cavell, of Northville, Mich., were assigned all questions on cattle. Drs. W. J. Madell, of Jackson, Mich., and A. J. Kline, of Wauseon, Ohio, handled swine.

The election of officers resulted as follows: President, Dr. George D. Gibson, Adrian; vice-president, Dr. John W. Timms, Hudson; secretary, Dr. Lynn C. Palmer, Brooklyn.

Minneapolis, the Metropolis of the Northwest

HUDSON VALLEY VETERINARY MEDICAL SOCIETY

The regular quarterly meeting of the Hudson Valley Veterinary Medical Society was held at Catskill, N. Y., May 9, 1928.

After a fine luncheon at Hotel Saulpaugh, attended by over thirty members of the Society, accompanied in many instances by their wives and guests, the meeting convened at the well-equipped hospital of Dr. L. L. Parker.

After a short business session, Dr. E. L. Brunett, of New York State Veterinary College, Cornell University, was introduced as the speaker of the day. He outlined the general symptoms and methods of diagnosis of several important diseases of poultry, including bacillary white diarrhea, coccidiosis and tuberculosis. Methods of injecting tuberculin and drawing blood samples were demonstrated on living birds. The agglutination test was explained and the reading of results was illustrated by specimen tests from Dr. Parker's laboratory. Many questions were asked relative to the diseases discussed and various methods of treatment and control were described.

A considerable number of specimens, both live and dead birds, were presented for examination. Numerous autopsies were held by Dr. Brunett and quite a variety of interesting conditions were shown. Intestinal parasites, including tapeworms

and roundworms, were the principal troubles disclosed. In several instances, microscopic examinations were necessary to determine the specific causes for the conditions found. While the meeting was devoted entirely to poultry problems, the interest manifested by those present indicated that veterinarians are deeply concerned in the welfare of the poultry industry.

J. G. WILLS, *Secretary.*

Minneapolis, the Breadbasket of the World

KANSAS CITY ASSOCIATION OF VETERINARIANS

The regular monthly meeting of the Kansas City Association of Veterinarians was held Wednesday evening, May 16, 1928, at the Hotel Baltimore. About thirty veterinarians were in attendance. The subject of castration was discussed in its various phases. Dr. R. R. Dysktra, dean of the Division of Veterinary Medicine, Kansas State Agricultural College, gave a most interesting talk on the castration of large animals and Dr. J. C. Flynn, of Kansas City, discussed the castration of small animals.

Minneapolis, the City of Lakes

SOUTHWESTERN MICHIGAN VETERINARY MEDICAL ASSOCIATION

The semi-annual meeting of the Southwestern Michigan Veterinary Medical Association was held at the Columbia Hotel, Kalamazoo, May 17, 1928. Dr. L. B. Sholl, of Michigan State College, discussed "Milk Fever and Pathology of the Udder." Mr. J. P. Torrey, also of Michigan State College, discussed "Bacteriology of the Udder." Dr. B. J. Killham, of Lansing, State Veterinarian, covered the rabies situation at considerable length. The meeting wound up with a dinner. Arrangements were in charge of Drs. E. C. Goodrich, of Kalamazoo, L. A. Ruff, of Marshall, and John A. Schaefer, of Bangor.

Minneapolis, the Youngest City of Its Size in the World

SOUTHWESTERN MISSOURI VETERINARY MEDICAL ASSOCIATION

The spring meeting of the Southwestern Missouri Veterinary Medical Association was held at Monett, Mo., May 23, 1928.

The meeting was held at the beautiful club house in the city park. About twenty-five veterinarians were in attendance. Many of them brought their wives, who were entertained by the local ladies. A most interesting program was carried out.

The principal topics discussed were abortion and mastitis in cattle and various diseases of swine.

Monett is the strawberry capitol of southwestern Missouri and a fine dinner was served by the ladies of the First Baptist Church, featuring this fruit. The president of the local Rotary Club made a splendid address. Plans were completed for entertaining the Missouri State Veterinary Medical Association at Carthage, the last week in June.

An election of officers resulted as follows: President, Dr. H. J. McCarthy, Joplin; secretary, Dr. B. M. Troxel, Mt. Vernon.

Minneapolis, the Financial, Wholesaling, Jobbing, Retailing, Manufacturing, Distributing, Educational, Cultural Metropolis of the Northwest

CONESTOGA VETERINARY CLUB

The regular monthly meeting and the fifteenth annual shad supper of the Conestoga Veterinary Club was held at the Stock Yards Inn, Lancaster, Pa., May 24, 1928.

Dr. M. F. Barnes, director of the laboratory of the Pennsylvania Bureau of Animal Industry, Harrisburg, presented a paper, entitled, "Bang Bacillus Disease." This was discussed by Dr. G. A. Dick, supervisor of Veterinary Extension, University of Pennsylvania, who related his observations of the disease over a considerable period.

Dr. H. B. Mitchell, city milk inspector of Lancaster, acted as toastmaster at the shad supper, which was served at 6:30. Mayor F. C. Musser, who is president of the Lancaster Live Stock Exchange, was the first speaker. He scored milk companies which do not encourage tuberculin testing. He promised drastic action to enforce milk ordinances and emphasized the ever-growing friendliness and cooperation between live stock owners and the veterinary profession. Others who were called upon to make addresses included the following: Dr. C. J. Marshall, University of Pennsylvania; Dr. A. D. McEwen, Research Institute of the Royal Veterinary College, London, England; Dr. T. E. Munce, director of the Pennsylvania Bureau of Animal

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Industry; Dr. J. B. Reidy, B. A. I. Inspector-in-Charge of Tuberculosis Eradication in Pennsylvania; Dr. Vincent C. Moyer, Supplee-Wills-Jones Company, Philadelphia; Dr. Robert O. Rothermel, of Reading, Pa., president of the Schuylkill Valley Veterinary Club and Dr. U. S. G. Bieber, mayor of Kutztown, Pa.

The meeting adjourned with the understanding that there would be a joint meeting of the Conestoga Veterinary Club with the Schuylkill Valley Veterinary Club and the Cumberland Valley Veterinary Club at the State Laboratory, Harrisburg, on June 21, the invitation having been extended by Dr. T. E. Munce.

HENRY S. WEBER, *Secretary.*

Minneapolis, by the Waters of Minnetonka

NORTHEASTERN ILLINOIS VETERINARY MEDICAL ASSOCIATION

The veterinarians of Boone, Lake, McHenry, Cook and Walworth counties (Ill.) met in Woodstock, Ill., May 25, and organized the Northeastern Illinois Veterinary Medical Association. Officers were elected as follows: President, Dr. H. P. Zimmerman, Woodstock; vice-president, Dr. J. L. Redding, Waukegan; secretary, Dr. H. Paul Gray, Woodstock. It is planned to hold meetings at regular intervals.

Minneapolis, the Land of Hiawatha

MIAMI VALLEY VETERINARY ASSOCIATION

A meeting of the Miami Valley Veterinary Association was held at the Hotel Bancroft, Springfield, Ohio, June 6, 1928. Fourteen veterinarians from Franklin, Montgomery, Clark, Miami and Greene counties were in attendance. Dr. F. A. Zimmer, of Columbus, Ohio, State Veterinarian, delivered the principal address and urged strict cooperation between local veterinarians and the state regulatory authorities, as the best means of eradicating diseases of live stock. Dr. Zimmer stated that the veterinary profession in Ohio was directly responsible for the health and welfare of live stock and poultry valued at approximately \$225,000,000. Following the business session, the members of the Association and their wives were entertained at dinner. Drs. Bruce Runyan and P. A. Dillahunty, of Springfield, looked after the arrangements for the meeting. The local newspapers gave some splendid publicity to the meeting.

OKLAHOMA STATE VETERINARY MEDICAL ASSOCIATION

The fourteenth semi-annual meeting of the Oklahoma State Veterinary Medical Association was held at Stillwater, June 11-12, 1928. The sessions were held in the Biology Building of the Oklahoma A. & M. College. Dr. George Pugh, of Lawton, presided. Owing to the absence of Dr. C. H. McElroy, acting president of the College, Professor C. T. Dowell, dean of agriculture, delivered the address of welcome. Dr. C. C. Hisel, State Veterinarian, made the response.

Following the reading of the minutes of the annual meeting, Dr. Hisel made the report on the publication of the proceedings of the Tuberculosis Eradication Conference, held in Oklahoma City, in February. He suggested that uniform rules and regulations for the interstate movement of poultry be adopted. On motion duly made and seconded, a committee was appointed to draft regulations and report later in the meeting.

Dr. C. H. Kitselman, of Kansas State Agricultural College, gave a very able lecture on the agglutination test. Later, he demonstrated the test in the laboratory and each veterinarian present was shown how to start a test.

Dinner was served at the College cafeteria at 6:15. After a very enjoyable meal, Dr. Hisel acted as toastmaster and called upon each member for a short talk. After dinner, all retired to the College Auditorium for a Lyceum number.

Professor R. O. Whittenton, of the Zoology Department of the College, gave a lecture on the classification and life cycles of the parasites of domestic animals. Following the lecture, the members went to the laboratory and were permitted to examine some of the more common parasites under the microscope.

Dr. H. W. Orr, of Stillwater, gave a talk on the laboratory diagnosis of parasitic diseases and later demonstrated methods in the laboratory.

Dr. Pugh discussed the advisability of raising the dues of the Association. This question was referred to the Resolutions Committee, which body canvassed those present and found opinion to favor raising the annual dues from \$2.00 to \$5.00. A resolution recommending this action will be presented to the Association at the next annual meeting.

Dr. Hisel suggested the advisability of the Association having a booth at the National Poultry Show, to be held at Ardmore.

After considerable discussion, a committee was appointed to look into the matter. A motion prevailed to assess each member of the Association \$2.00 to help defray the expenses of maintaining a booth at the National Poultry Show.

Dr. C. R. Walter, of Tulsa, read a very interesting paper on common parasites in dogs and cats, symptoms, diagnosis and treatment. This was followed with a paper by Dr. O. E. Robinson, of Bixby, covering the parasites of swine. This was illustrated with lantern-slides. Dr. Orr then read a paper on parasites of poultry.

Lack of time prevented the presentation of several other papers, which were scheduled on the program.

FRANK R. KNOTTS, *Secretary*.

Minneapolis, Where Guest is King

MINNESOTA'S OLD-TIMERS

Minnesota has thirteen veterinarians who have been members of the A. V. M. A. continuously for twenty years or longer. Dr. M. H. Reynolds, of St. Paul, is the oldest member, with 37 years to his credit. Dr. C. E. Cotton, of Minneapolis, comes next with an even 30. Dr. J. N. Gould, of Worthington, is one year behind, with 29. Drs. T. Lambrechts, of Montevideo, and D. M. McDonald, of St. Paul, have 26-year records.

Dr. J. Butters, of Renville, is at the quarter-century mark. Drs. M. S. Whitcomb, of St. Paul, and C. B. Estey, of St. Cloud, have 24 and 21 years, respectively, to their credit. Drs. Wm. A. Anderson, of Sleepy Eye, J. P. Foster, of Minneapolis, C. A. Nelson, of Brainerd, Wm. C. Prouse, of Minneapolis, and O. C. Selby, of Mankato, reached the 20-year mark this year.

With one exception, these men have been in Minnesota for the entire period mentioned in each case, and eleven are at the same location now as when they joined the A. V. M. A.

A suggestion: These thirteen members should get together at Minneapolis and have a group picture taken, representing an aggregate of 318 years of membership in the A. V. M. A.

Minneapolis, the Financial, Wholesaling, Jobbing, Retailing, Manufacturing, Distributing, Educational, Cultural Metropolis of the Northwest

NECROLOGY

SAMUEL H. BURNETT

Dr. Samuel H. Burnett died at Ithaca, N. Y., April 30, 1928. He had been confined to his bed for several years, as a result of tuberculous infection and the sequelae of a typhoid infection of many years standing.

Born at Webster, New York, November 18, 1869, Dr. Burnett was graduated from the New York State Veterinary College at Cornell University in 1902. He received the degrees of A. B. and M. S. from the same institution. Dr. Burnett taught for several years as a member of the faculty of his Alma Mater. His work was in the field of pathology and bacteriology. Dr. Burnett was the author of "Clinical Pathology of the Blood of Animals," as well as of numerous papers of a research character based upon his work in his particular field.

Dr. Burnett joined the A. V. M. A. in 1905. He is survived by his widow and one daughter. Funeral services and burial were at Webster, N. Y.

WILLIAM D. NOTTINGHAM

Dr. William D. ("Dick") Nottingham, of Fowlerton, Indiana, died May 2, 1928, at the age of 56. He was a graduate of the Indiana Veterinary College, class of 1911, and was engaged in private practice.

ROBERT W. McCULLY

Dr. Robert W. McCully, of New York City, died at Roosevelt Hospital, May 7, 1928. Although handicapped by diabetes for the past few years, Dr. McCully had applied himself incessantly to his work and finally a series of catastrophes, in rather rapid succession, terminated his unusually active career. His wife's sudden demise on Christmas Eve, a railroad wreck, while he was en route to Hot Springs, Ark., the first week in February, and an emergency operation, necessitated by injuries received in the wreck, performed the last week in March, ushered in diabetic coma on May 1 and the passing six days later of a man who probably had the most remunerative specifically equine practice on the North American Continent.

Born in St. Thomas, Ontario, December 16, 1869, Dr. McCully received his veterinary education at the Ontario Veterinary College. He was graduated in 1890. He came to the United States about 1895. After a short stay in Detroit, Mich., he went east and located in New York City. He soon became associated with the late Dr. Ralph Hall on 24th Street. Shortly after locating in New York City, Dr. McCully was employed by Fiss, Doerr & Carroll, as veterinarian to their large sales barn. Later the firm requested Dr. McCully to give them all of his time and to relinquish all other practice. This he declined to do. Then Dr. McCully started to build up a clientele among owners of race horses and other wealthy horsemen that resulted in one of the most lucrative veterinary practices that the world has ever known. Having a cordial, genial personality and being a tireless worker, Dr. McCully soon forged to the front and upon the death of his preceptor, in 1904, he became the moving spirit in an established practice. With the partial incapacity of Dr. William Shepherd, of Sheepshead Bay, in 1907, Dr. McCully soon acquired a near monopolistic entrenchment on the Thoroughbred turf of New York.

Constantly under high nerve tension and not enjoying the best of health, being afflicted with asthma for many years, he was a hard, relentless taskmaster for his associates in the conduct of his practice. But a superlative degree of business acumen, tact, diplomacy and psycho-analytical ability won for him the confidence of leaders in the business and social world, and this, together with the latitude given less fortunate individuals, who could not meet their obligations promptly, and a vast amount of professional service rendered gratis, gave him a dominating position among his profession on the turf.

Dr. McCully joined the A. V. M. A. in 1901. He is survived by a sister, Mrs. Alice DeLine, of Hillsboro, Ore.

H. C. C.

DENNIS A. FOX

Dr. Dennis A. Fox, of Winn, Michigan, died at his home, January 15, 1928. He was a graduate of the Grand Rapids Veterinary College, class of 1917, and was in general practice. He is survived by his widow, one daughter and two sons.

ROY L. BURGER

Dr. Roy L. Burger, of Long Lake, Mich., died at his home, March 22, 1928, after an illness of several months. He was in his 56th year. Following his graduation from the Grand Rapids Veterinary College, Dr. Burger practiced at Ionia, Michigan, until 1918, when he moved to Long Lake. He is survived by his widow, one son and one sister.

BRINSON CARL DAVIS

Dr. B. C. Davis, of Carrollton, Mo., died April 2, 1928, after a protracted illness.

Born at Lena, Mississippi, February 9, 1876, Dr. Davis received the degree of B. S. from the National Normal University before studying veterinary medicine. He located at Carrollton immediately upon his graduation from the Kansas City Veterinary College in 1904 and built up a fine practice in that community.

Dr. Davis joined the A. V. M. A. in 1922. He was a member and past president of the Missouri Veterinary Medical Association.

ELMER A. ASSMAN

Dr. Elmer A. Assman, of Camp Chase, Ohio, died April 27, 1928, at the age of 37 years. Death was due to cerebral hemorrhage. Dr. Assman was a graduate of Ohio State University, class of 1921. He was in the employ of the Columbus (Ohio) *Evening Dispatch* at the time of his death. He is survived by his widow, one daughter, one son and two brothers.

FRANCIS GALLAGHER

Dr. Francis Gallagher died at his home in Camden, N. J., May 11, 1928, after a brief illness. He was a graduate of the New York State Veterinary College at Cornell University, class of 1906. For some years following his graduation, Dr. Gallagher was in the service of the Bureau of Animal Industry and later entered private practice. He is survived by two sisters and two brothers.

JOHN H. SUMMERS

Dr. John H. Summers, of Oxford, Ohio, died May 18, 1928, under distressing circumstances. He was suffering from a head-

ache and went to his medicine cabinet to get a dose of medicine to relieve his headache. He did not have his glasses on and picked up a bottle containing tincture of gelsemium. He did not realize the seriousness of his error, but went to dinner in a nearby restaurant. He ate a hearty meal, arose and started for the door. There he staggered and collapsed. In less than an hour he was dead, in spite of the heroic efforts of physicians.

After graduating from the Ontario Veterinary College in 1896, Dr. Summers located in Oswego, N. Y. Two years later he moved to Oxford, Ohio, where he built up a fine practice and made a host of friends. He was a member of Hamilton Lodge, B. P. O. E., and Invincible Lodge, I. O. O. F. Dr. Summers was a widower and left no children. He was 58 years old.

RUFUS W. FINLEY

Dr. Rufus W. Finley, of Rockford, Ill., died May 20, 1928, after an illness of two years. For three weeks prior to his death, he had been confined to his bed.

Born at Cherry Fork, Ill., February 3, 1863, Dr. Finley attended high school and the Chicago Veterinary College. He was graduated from the latter institution in 1891, with the degree of D. V. S., and in 1895 received the degree of M. D. C. He also was a graduate of the S. S. Hammel School of Elocution and Oratory and the Walter C. Lyman School of Acting.

Dr. Finley located in Rockford about 35 years ago and built up a general practice there. He was active in fraternal circles, being a member of Star in East Lodge, No. 166, A. F. & A. M., the Commandery, Tebala Shrine and Freeport Consistory. He was potentate of the Shrine in 1918. Dr. Finley also held various important offices in the Knights of Pythias. During parades held in Rockford on national holidays, he frequently was at the head of the procession, impersonating Uncle Sam.

Dr. Finley joined the A. V. M. A. in 1922. He is survived by a daughter, two brothers and one sister. Funeral services and burial were held at Clarinda, Iowa.

JEROME F. BUTTERFIELD

Dr. Jerome F. Butterfield, of Riverside, Calif., died June 1, 1928. Born in South Montrose, Pa., May 11, 1846, Dr. Butterfield attended the Ontario Veterinary College and was graduated in 1886. He practiced in his home community in Susquehanna

County, Pennsylvania, until 1911, when he removed to California. He practiced in his new location for a few years, but had practically retired from active work. Dr. Butterfield held Certificate No. 7, granted under the Veterinary Practice Act of 1905, by the Pennsylvania State Board of Veterinary Medical Examiners. The five members of the Board held certificates 1 to 5, so Dr. Butterfield was one of the first to be licensed under the 1905 law, which required annual registration in Pennsylvania.

Dr. Butterfield is survived by his widow, two sons and one daughter. Members of the veterinary profession were pallbearers at the funeral.

ACE OVERTON DONOHEW

Dr. A. O. Donohew, of Boonville, Mo., died May 29, 1928, at St. Joseph Hospital, Boonville, after an illness of two weeks. Death was due to septicemia, following injuries received while treating a patient.

Born in Mt. Sterling, Ky., August 17, 1865, Dr. Donohew came to Missouri with his parents when five years of age, locating at Lamonte. He attended the University Veterinary College, Kansas City, and was graduated in 1903. He practiced at Slater and Fayette, before locating at Boonville.

Dr. Donohew was affiliated with the Knights of Pythias and the I. O. O. F. He is survived by his widow and two daughters.

WARNER SIDENER

Dr. Warner Sidener, of Danville, Ill., died June 12, 1928. Heart disease was the cause of death.

Born January 25, 1879, at Crawfordsville, Ind., he attended high school and saw three years of military service at the time of the Spanish-American War. He entered the Indiana Veterinary College and was graduated in 1909. He again entered military service during the World War, serving for fourteen months.

Dr. Sidener joined the A. V. M. A. in 1920. He was also a member of the Illinois State Veterinary Medical Association. He is survived by his widow, two daughters, one brother and two sisters.

WILLARD L. TRAWVER

Dr. Willard L. Trawver, of Des Moines, Iowa, is reported to have been killed in an automobile accident, over a year ago. He was a graduate of the Kansas City Veterinary College, class of 1916, and practiced at Corning, Iowa, for a while.

CLARENCE W. CLARK

Dr. Clarence W. Clark, of Ashland, Wis., died at a local hospital, June 18, 1928. Death was due to septicemia which developed following an operation performed a few days previously. He was about 50 years of age.

Born in Hamilton County, Indiana, Dr. Clark secured his veterinary training at the Chicago Veterinary College. He was a member of the class of 1910. He practiced at Hagerstown, Ind., Rice Lake and Park Falls, Wis., before locating at Ashland, where he practiced for about ten years.

Dr. Clark joined the A. V. M. A. in 1912. He was also a member of the Wisconsin Veterinary Medical Association. He is survived by his widow, two children and two brothers.

CLEVE S. PULLEN

Dr. Cleve S. Pullen, of Detroit, Mich., 48 years of age, died at his home, June 8, 1928, after a three-day illness. He had suffered from heart trouble for several years. Dr. Pullen was a graduate of the Grand Rapids Veterinary College, class of 1909, and practiced at Fowlerville, Mich., until 1912, when he located in Detroit. From 1919 to 1923, he was a dairy inspector in the Department of Health. Since 1923, he had been in private practice. He is survived by his widow, an adopted son, and one sister.

TRUMAN EARL GORE

Dr. Truman E. Gore, of Clarksburg, W. Va., died June 18, 1928, after a long illness. He had been a sufferer from diabetes for several years, complicated by frequent attacks of rheumatism. Through all of his long illness, Dr. Gore retained his full mental faculties and genial disposition. He seemed to recognize the seriousness of his condition and accepted it in a characteristically philosophical manner.

Born August 2, 1871, on his father's farm, at Gore, W. Va., he received his veterinary training at the Ontario Veterinary College. Following his graduation in 1895, he returned to Clarksburg and built up a lucrative practice there. He also had extensive holdings in a number of business enterprises in his city.

Dr. Gore was a brother of Hon. Howard M. Gore, governor of West Virginia. During the campaign of his brother for governor, Dr. Gore visited every section of the State and was

highly instrumental in bringing about both the nomination and election of his brother. Dr. Gore took an active part in political affairs, and after his brother was inaugurated, he was a frequent visitor at the executive offices in the role of counselor. He possessed rare good judgment and his advice was always highly valued by those who sought it.

Dr. Gore joined the A. V. M. A. in 1912. He was unquestionably the most widely known veterinarian in his section of the country. The funeral was the largest ever held in Clarksburg, and was attended by prominent persons from all over West Virginia and adjoining states. He is survived by his widow, a son and one daughter.

EDWIN T. MEREDITH

Hon. E. T. Meredith, Secretary of Agriculture in the cabinet of President Wilson, died at Des Moines, Iowa, June 17, 1928, after a protracted illness. Mr. Meredith was editor of a number of well-known agricultural periodicals and he was elected to honorary membership in the American Veterinary Medical Association at the 1920 meeting.

PERSONALS

MARRIAGE

Dr. Lloyd Charles Moss (Wash. '23) to Miss Gladys Elnora Shumaker, both of Honolulu, Hawaii, June 6, 1928.

PERSONALS

Dr. Albert E. Lauts (K. S. A. C. '28) has located at Spencer, Nebr.

Dr. F. W. Godsall (Chi. '02) has located for practice at Kewanee, Ill.

Dr. W. E. Welsh (Iowa '27) is Dairy and Food Inspector of Hibbing, Minn.

Dr. M. L. Bryant (Corn. '21) has removed from Montpelier, Vt., to Middlebury, Vt.

Dr. W. A. Browne (K. S. A. C. '28) has located for practice at Cottonwood Falls, Kans.

Dr. Harry W. Eggleston (Corn. '14) has removed from Alden, N. Y., to Wellsboro, Pa.

Dr. H. C. Berger (Cin. '17), formerly of Cincinnati, Ohio, is now located at Prentiss, Miss.

Dr. R. K. O'Neil (Corn. '27) is associated with Dr. F. D. Egan (Ont. '23), of Detroit, Mich.

Dr. F. L. Cusack (Chi. '92), of Carrington, N. Dak., is sheriff of Foster County, N. Dak.

Dr. D. B. Pellette (K. S. A. C. '12), formerly of Madison, Fla., is now located at Monticello, Fla.

Dr. D. D. Ford (Corn. '27) is practicing with Dr. F. E. McClelland (Corn. '09), of Buffalo, N. Y.

Dr. John N. McIllynay (K. S. A. C. '28) is associated with Drs. Norden and Perrin, of Lincoln, Nebr.

Dr. C. L. Miller (O. S. U. '22) announced the opening of his new Oak Park Animal Hospital, at Oak Park, Ill., June 1.

Dr. J. B. Paterson (Edin. '78), formerly located Ogema, Sask., is now in Regina, Sask. Address: 4177 Victoria Ave.

Dr. J. C. Nowlen (Chi. '18), of Woodstock, Ill., has received an appointment to the staff of the state veterinarian of Illinois.

Dr. N. S. Mayo (Chi. '89), of North Chicago, Ill., will sail for Europe on July 12. Mrs. Mayo will accompany him.

Dr. J. W. Roberts (Chi. '17), of Galena, Ill., has sold his practice to Dr. G. W. Evert (Chi. '05) and will move to Warren, Ill.

Dr. O. W. Winters (Ont. '04), of Danville, Ill., has been appointed City Veterinarian, succeeding Dr. William Stratman (Chi. '09).

Dr. R. P. Wilson (McK. '04), of Rockford, Ill., is planning the erection of a veterinary hospital to cost in the neighborhood of \$35,000.

Dr. Harold McCrillis (Iowa '28) has requested that his JOURNAL be mailed to him at South Union and Park Avenue, Des Moines, Iowa.

Dr. G. W. Evert (Chi. '05) has purchased the practice of Dr. J. W. Roberts, (Chi. '17) at Galena, Ill., and will resume practice at that place.

Dr. Lynn C. Palmer (Mich. '20), formerly of Brooklyn, Mich., is now associated with Dr. E. C. Goodrich (Gr. Rap. '15), of Kalamazoo, Mich.

Dr. Glen L. Dunlap (K. S. A. C. '28) has accepted a position as assistant pathologist at the Massachusetts Agricultural College, Amherst, Mass.

Dr. Charles E. Mummert (Ind. '07), of Young America, Ind., was recently reappointed a member of the Indiana State Live Stock Sanitary Board.

Dr. Stevenson Moore, Jr. (U. P. '27), of Chicopee, Mass., has been appointed Municipal Veterinarian and Inspector of Animals by the Mayor of his City.

Dr. C. A. Dionne (Chi. '11), of Beaverville, Ill., has established a call office at Donovan, Ill. Dr. Dionne will be in Donovan Wednesday of each week.

Dr. E. B. Ackerman (Amer. '91) has removed from his former location on Jerico Turnpike to East Main Street, in the Fort Hill Section, Huntington, L. I.

Dr. J. H. Wilson (Ont. '90), of London, Ont., was promoted to the full rank of Colonel in the Department of National Defense of Canada, March 1, 1928.

Dr. F. S. Jones (U. P. '08), of the Rockefeller Institute for Medical Research, Princeton, N. J., has been given leave of absence to visit Europe and sailed June 9.

Dr. Walter Wisnicky (K. S. A. C. '26), who has been at the University of New Hampshire the past year, has requested a change of address to Fond du Lac, Wis.

Dr. Rafael F. Santa Maria (Havana '10) has requested a change of address from Ave. Estrada Palma No. 25, Camaguey, Cuba to Calle 3a, entre A y B Vedado, Havana.

Dr. G. W. McNutt (Iowa '17), of Clear Lake, Iowa, has taken up the position in anatomy left vacant by Dr. George R. Fowler (Wash. '25), at the State College of Washington.

Dr. A. W. Mebert (Gr. Rap. '07), of Traverse City, Mich., sustained a fracture of his left leg, above the ankle, in a fall he received while engaged in professional work near Kingsley, Mich.

Dr. C. J. Scott (Iowa '08), of Knoxville, Iowa, the energetic secretary of the Iowa Veterinary Medical Association, was a delegate to the Republican Convention in Kansas City, last month.

Dr. A. Prater (Chi. '12), of Cowden, Ill., has accepted a position with the Illinois State Department of Agriculture and has been assigned to tuberculin testing, with headquarters at Waukegan, Ill.

Drs. J. F. Pilon (Chi. '12) and H. S. Wooters (Chi. '13), of Champaign, Ill., have dissolved their partnership. Dr. Pilon will continue to practice at 502 North Hickory St., the old location of the partnership.

Dr. Lionel Stevenson (Ont. '26), who has been in charge of extension work at the Ontario Agricultural College, has been appointed Provincial Zoologist, with headquarters at the Ontario Veterinary College, Guelph.

Dr. Chas. H. Rosenstiel (Chi. '08), of Mt. Carroll, Ill., has purchased a home in Champaign, Ill., and will make his home there for an indefinite period. Dr. Rosenstiel's oldest son will enter the University of Illinois this fall.

Dr. C. N. Bramer (Corn. '23) has resigned his position at the Hinckley Veterinary Hospital, Buffalo, N. Y., and has joined the staff of the new veterinary hospital of Dr. J. V. Lacroix (K. C. V. C. '06), at Evanston, Ill.

Dr. D. M. Moses (Chi. '16), formerly Hamilton County (Ill.) Veterinarian, has been appointed Randolph County (Ill.) Veterinarian, by the County Board of Supervisors. Dr. Moses will have his headquarters at Sparta, Ill.

Dr. J. D. Reardon (McK. '09), manager of the Peoria, Ill., branch of the Royal Serum Company, uses an airplane to make his rounds. He recently made a trip to Adair, Ill., for the purpose of calling on Dr. G. A. Gray (Chi. '10) at that place.

Dr. C. L. Woolard (Chi. '17) has returned from Tampa, Fla., to Benton, Ill., and has resumed practice there. Dr. Woolard was in Florida for three years and held the position of Chief Meat and Milk Inspector for the city of Tampa, while in that city.

Dr. D. R. Herberich (Chi. '20), of Kempton, Ill., recently suffered a painful injury when one of his equine patients almost bit off the thumb of his left hand. A letter from Dr. Herberich, dated June 14, reported the injured member healing nicely.

Dr. W. H. Redhead (O. S. U. '04), of Cleveland, Ohio, was seriously ill with erysipelas during May and confined in the City Hospital. A report, received during the early part of June, indicated that Dr. Redhead had returned home and was slowly regaining his strength.

Dr. J. S. McDaniel (K. C. V. C. '09), who has been associated with Dr. M. E. Gouge, at Sedalia, Mo., for a number of years, recently purchased the practice and equipment of the late Dr. C. A. Donohew, of Boonville, Mo. Dr. McDaniel expects to remain in Boonville permanently.

Dr. Joseph P. Scott (O. S. U. '14), associate professor of pathology, Kansas State Agricultural College, has been granted a sabbatical leave of absence for further studies on anerobic bacteriology. He will pursue these studies in the Department of Bacteriology, University of Colorado School of Medicine, Denver.

Dr. D. A. Yandell (K. S. A. C. '23), who has been with the American Society for the Prevention of Cruelty to Animals, New York City, for the past three years, has resigned his position and has joined Dr. Wm. R. Ecker (O. S. U. '11) in conducting the Newark Dog and Cat Hospital and Clinic, at 787 Clinton Ave., Newark, N. J.

Dr. Hubert Shull (Ont. '16), of Texarkana, Ark., was elected District Governor of the Lions at the convention of District No. 7, held in Fayetteville, Ark., May 21. Dr. Shull served the Lions Club of Texarkana as secretary for a number of years and at a recent election he was elevated to the presidency of the Club.

Dr. H. J. Rollins (K. C. V. C. '16), of Rockingham, N. C., led the field in the Democratic primaries, June 2, 1928, for county commissioner. Twelve men were in the race, including five incumbents whose terms of office were drawing to a close. Dr. Rollins rolled up a handsome vote of 2,555, out of a total of 4,207 votes cast, indicative of the confidence which the good people of Richmond County have in the business integrity of Dr. Rollins.

BUREAU TRANSFERS

Dr. Chas. H. Leavitt (Chi. '06) from Boise, Idaho, to Olympia, Wash., on tuberculosis eradication.

Dr. Oscar M. Webb, Jr., from Chicago, Ill., to Cincinnati, Ohio, on meat inspection.

Dr. Guy M. Parrish, Jr. (A. P. I. '15), from Raleigh, N. C., to Columbia, S. C.

Dr. Arthur Salinger (U. P. '94), from Newark, N. J., to New York, N. Y., on meat inspection.

Dr. George D. Loder (McK. '18), from Sacramento, Calif., to Portland, Ore., on meat inspection.

Dr. Wm. C. Dye (K. C. V. C. '08), from Reno, Nevada, to Salt Lake City, Utah, on field inspection.

Dr. Joseph A. Wilkinson (U. P. '07), from Chicago, Ill., to Fort Worth, Texas, on tick eradication.

Dr. Daniel C. Becker, Jr., from Chicago, Ill., to Fort Worth, Texas, on tick eradication.

Dr. James C. Burneson (Ont. '91), from Chicago, Ill., to Dayton, Ohio, on meat inspection.

Dr. Thomas V. Coe (O. S. U. '11), from Dayton, Ohio, to Columbus, Ohio.

Dr. Lawrence Lewis, Jr. (Chi. '09), from Chicago, Ill., to Phoenix, Ariz., on meat inspection.

Dr. H. B. Raffensperger (Chi. '09), from Chicago, Ill., to Miles City, Mont., in charge of zoological laboratory.

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August, 1928

No. 4

ON TO MINNEAPOLIS

By the time this issue of the JOURNAL reaches those of our members who are located a considerable distance from Detroit, the sixty-fifth annual meeting of the American Veterinary Medical Association will be in full swing at Minneapolis. It promises to be a history-making and, in all likelihood, a record-breaking meeting.

The official program contains the titles of exactly fifty papers—probably the most comprehensive and best balanced program that has ever been offered those attending an A. V. M. A. convention. A tentative outline of this program was published last month. No material alterations have been found necessary. Several additional subjects have been added, these having been in doubt when we went to press with the July number.

Perhaps the most impressive part of the program is that being offered by the Section on General Practice, with seventeen papers. Supplement this literary symposium in the realm of practice, the results of the efforts of the officers of the Section on General Practice, with the clinical demonstrations to be staged at University Farm, on Friday, under the direction of Dr. W. L. Boyd, chairman of the Subcommittee on Clinics, and the practitioners have a treat that is offered only on rare occasions.

Looking to the business side of things, the program gives only a hint of the vast amount of business to be transacted. It is no

idle jest for us to say that "business is increasing." This fact was strongly reflected in the brief reference made to the recent special meeting of the Executive Board, in the July issue of the JOURNAL. When we got to the point of writing up the minutes of the meeting, we found that it required sixteen typewritten pages to record the transactions.

Seriously, our activities have been expanding at a more rapid rate than any of our members realize. There is serious question as to the advisability of taking more than one-half the time available at annual meetings for the transaction of business.



DR. ROBERT S. MacKELLAR
Member-at-large, Executive Board

Would it not be possible to delegate a large portion of this business to a small, representative group of our members, and thereby conserve valuable time for the reading and discussion of scientific papers? Scores of members say that they do not like to sit for hours listening to committee reports and the like. The most concrete evidence that we have of this fact is the comparatively small attendance at some of the business sessions. The four business sessions at Philadelphia consumed ten hours all but ten minutes.

On the other hand there are those members who are deeply interested in the purely business side of the organization. They show their interest in more ways than one. Will these members be perfectly content to have a large part of the business of the A. V. M. A. transacted by a relatively small number of members? What is the answer? The time has arrived when we must decide our future course.

Minneapolis, City of Lakes and Gardens

APPLICATIONS FOR MEMBERSHIP

See May, 1928, JOURNAL

FIRST LISTING

- ALLEN, D. L. Newton, Miss.
D. V. M., Alabama Polytechnic Institute, 1927
Vouchers: S. J. Horne and R. V. Rafnel.
- BILLINGS, WILLIAM A. University Farm, St. Paul, Minn.
D. V. M., Cornell University, 1918
Vouchers: C. P. Fitch and R. Fenstermacher.
- BOLLE, ARTHUR C. Petersburg, Ill.
D. V. M., Chicago Veterinary College, 1918
Vouchers: C. E. Lucas and W. B. Holmes.
- BOND, HAROLD G. 335 Crestview Rd., Columbus, Ohio.
D. V. M., Ohio State University, 1915
Vouchers: D. M. Swinehart and H. W. Feldwish.
- CAMPBELL, H. L. Tuscola, Ill.
D. V. M., Kansas City Veterinary College, 1915
Vouchers: C. C. Hastings and W. H. Welch.
- CONN, GEORGE H. 25 N. Wise Ave., Freeport, Ill.
D. V. M., Cincinnati Veterinary College, 1913
B. S. A. H., Iowa State College, 1921
Vouchers: Roy E. Kluck and R. V. Rafnel.
- COON, ELVIN R. P. O. Box 157, Winamac, Ind.
D. V. M., Indiana Veterinary College, 1921
Vouchers: Edgar D. Wright and Clarence T. Howard.
- CRAWFORD, JOHN H. Hinckley Ill.
M. D. V., McKillip Veterinary College, 1897
Vouchers: C. C. Hastings and W. H. Welch.
- DARKE, CARLISLE N. 103-19 Springfield Blvd., Queens Village, N. Y.
D. V. S., American Veterinary College, 1892
Vouchers: Robert S. MacKellar and J. Elliott Crawford.
- DENNIE, FRANK W. 5346 Park Ave., Indianapolis, Ind.
D. V. M., Chicago Veterinary College, 1912
Vouchers: George W. Butler and Benj. H. Yenner.
- DENNIS, T. M. Clanton, Ala.
D. V. M., Alabama Polytechnic Institute, 1918
Vouchers: C. C. Middleton and C. A. Cary.
- DURANT, ADRIAN JACKSON Veterinary Department, University of
Missouri, Columbia, Mo.
D. V. M., Michigan State College, 1925
Vouchers: J. W. Connaway and O. S. Crisler.

- FOSTER, T. J. D. V. M., Ohio State University, 1909 Monticello, Ill.
Vouchers: C. C. Hastings and W. H. Welch.
- GRIESSMAN, LOUIS Nanuet, N. Y.
D. V. S., New York American Veterinary College, 1908
Vouchers: Robert S. MacKellar and Elmer Lash.
- HAENN, JOSEPH E. 343 Bourse Bldg., Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1912
Vouchers: Louis A. Klein and G. A. Dick.
- HALLORAN, D. J. Colton, S. Dak.
V. S., Ontario Veterinary College, 1908
Vouchers: C. C. Lipp and M. W. Ray.
- HARTWICH, HOMER A. Huron, S. Dak.
M. D. V., McKillip Veterinary College, 1910
Vouchers: C. C. Lipp and M. W. Ray.
- HECTORNE, RONALD L. Avon, Ill.
D. V. M., Ohio State University, 1928
Vouchers: C. C. Hastings and W. Lester Hollister.
- JONES, FREDERICK B. 922 Peoria St., Dixon, Ill.
D. V. M., Chicago Veterinary College, 1915
Vouchers: C. C. Hastings and Frank H. Brown.
- JOYCE, CHARLES OTTO Wanamaker, Ind.
D. V. M., Indiana Veterinary College, 1909
Vouchers: George W. Butler and Benj. H. Yenner.
- KAY, DAVID SCOTT 3208 - 36th Ave., S.W., Seattle, Wash.
D. V. S., San Francisco Veterinary College, 1911
Vouchers: C. L. Norris and P. A. Franzmann.
- KRAUS, ALVIN HERMAN Marengo, Iowa.
D. V. M., St. Joseph Veterinary College, 1913
Vouchers: J. F. DeVine and V. H. Miller.
- LOCKRIDGE, FOREST R. 208 Morgan St., Crawfordsville, Ind.
D. V. M., Indiana Veterinary College, 1921
Vouchers: T. A. Sigler and F. J. Muecke.
- LOWE, ALBERT CLAUD Buckhannon, West Va.
D. V. M., United States College of Veterinary Surgeons, 1923
Vouchers: S. E. Hershey and H. M. Newton.
- MARSHALL, JOHN WESLEY Genoa, Ohio.
D. V. M., Grand Rapids Veterinary College, 1909
Vouchers: D. M. Swinehart and O. V. Brumley.
- McCLURE, FRED K. 310 S. Chestnut St., Clarksburg, West Va.
D. V. M., George Washington University, 1912
Vouchers: S. E. Hershey and H. M. Newton.
- McDOWELL, CLARENCE Aberdeen, S. Dak.
V. S., Ontario Veterinary College, 1904
Vouchers: C. C. Lipp and M. W. Ray.
- MERSCH, LOUIS D. Sioux Falls Serum Company, Sioux Falls, S. Dak.
D. V. M., Iowa State College, 1928
Vouchers: W. C. Mitchell and C. P. Schneider.
- MURDOCK, D. C. 1316 South 33rd St., Omaha, Nebr.
M. D. C., Chicago Veterinary College, 1905
Vouchers: Cornelius H. Hoekstra and A. T. Everett.
- NISLEY, FRANK Hershey, Pa.
V. M. D., University of Pennsylvania, 1918
Vouchers: G. A. Dick and E. T. Booth.
- O'NEIL, ROBERT KENNETH 12041 E. Jefferson Ave., Detroit, Mich.
D. V. M., Cornell University, 1927
Vouchers: H. Preston Hoskins and F. D. Egan.

- OWENS, JAMES A. El Paso, Ill.
D. V. M., McKillip Veterinary College, 1918
Vouchers: Frank H. Brown and C. C. Hastings.
- PHELPS, OSCAR S. 322 E. Maple Ave., Beaver Dam, Wis.
M. D. C., Chicago Veterinary College, 1904
Vouchers: James S. Healy and V. S. Larson.
- ROBINSON, RAY S. Madison, S. Dak.
D. V. M., McKillip Veterinary College, 1914
Vouchers: C. C. Lipp and H. Preston Hoskins
- RUGGER, FRED ERNEST Lowden, Iowa.
V. S., Ontario Veterinary College, 1914
Vouchers: Grant B. Munger and John B. Bryant.
- SCHRUMPF, HARRY RUSSEL 345 N. Jefferson Ave., Indianapolis, Ind.
D. V. M., Indiana Veterinary College, 1923
Vouchers: George W. Butler and Benj. H. Yenner.
- SCOTT, PAUL FRANKLIN New Market, Ind.
D. V. M., Indiana Veterinary College, 1918
Vouchers: T. A. Sigler and F. J. Muecke.
- SELEMAYER, CHAS. W. 820 S. Newberry St., York, Pa.
V. M. D., University of Pennsylvania, 1921
Vouchers: Louis A. Klein and G. A. Dick.
- SHLIMOVITZ, BENJAMIN Black River Falls, Wis.
D. V. M., Indiana Veterinary College, 1921
Vouchers: James S. Healy and H. D. Larzelere.
- SMITH, FOREST F. Emery, S. Dak.
D. V. M., Iowa State College, 1928
Vouchers: C. C. Lipp and C. H. Stange.
- TOVAR, DANIEL ALFREDO Casilla 237, Callao, Peru, S. A.
D. V. M., Kansas City Veterinary College, 1914
Vouchers: J. F. Mitchell and A. T. Kinsley.
- UREN, ANDREW WALDMERE 714 Stewart Rd., Columbia, Mo.
D. V. M., Michigan State College, 1924
Vouchers: J. W. Connaway and O. S. Crisler.
- WANKE, V. F. Belleville, Wis.
V. S., Ontario Veterinary College, 1907
Vouchers: James S. Healy and H. D. Larzelere.
- WATT, C. S. Collinsville, Ill.
D. V. M., Chicago Veterinary College, 1915
Vouchers: S. D. Buzzard and A. A. Moore.

Applications Pending

SECOND LISTING

- Bachrach, Allan, 5449 N. 11th St., Philadelphia, Pa.
Beardslee, Russell Sidney, 143 Temple St., Oswego, N. Y.
Beck, John Dengler, 2404 West 16th St., Wilmington, Del.
Blatchford, Channing Rudolph, Brighton, Mich.
Brownridge, Joseph Garnet, Box 166, Stanton, Mich.
Calkins, Fred P., Sandusky, Mich.
Casey, Lloyd E., 2221 Cedar Springs Rd., Dallas, Texas
Chivers, Walter Harris, 215 Hyland, Ames, Iowa.
Cole, Harry Leach, 1518 N. Michigan Ave., Saginaw, Mich.
Collins, Clay R., Osceola, Nebr.
Dunn, Lucian Henry, Newell, S. Dak.
Esh, Lee McDowell, 39th St. & Woodland Ave., Philadelphia, Pa.
Foelschow, George W., 739 - 4th St., San Diego, Calif.
Glascock, Dale W., Audubon, Iowa.
Graf, Charles John, Stuart, Iowa.
Hadder, Walter Jones, Mecosta, Mich.
Hagenbuch, John Bertram, 5050 Baltimore Ave., West Philadelphia, Pa.

Hale, Maurice Wendell, 1891 Beacon St., Brookline, Mass.
 Harvey, Ebenezer Erskine, 50 S. Shelburne Rd., Greenfield, Mass.
 Hutt, Charles Edward, 1233 N. Randolph St., Philadelphia, Pa.
 Johnson, Mark M., 310 South Cerritos, Downey, Calif.
 Kelly, Thos. L., R. D. Box 97A, Danbury, Ohio.
 Mann, Rex I., Coldwater, Mich.
 Martindale, William Edgar, 1342 Harrison St., Frankford, Philadelphia, Pa.
 McArdle, LeRoy P., 109 - 7th Ave. N.W., Watertown, S. Dak.
 McConnell, Roy Lewis, Coffeyville, Kans.
 McNellis, Russell G., Janesville, Minn.
 Meehan, George Arthur, 634 Live Stock Exchange Bldg., South St. Paul, Minn.
 Meyer, E. F., 1839 Union Ave., Grand Rapids, Mich.
 Millar, Joseph Ambler Shoemaker, 705 Asbury Ave., Asbury Park, N. J.
 Miller, Claude William, Biglerville, Pa.
 Oderkirk, Charles C., 1835 American Ave., Long Beach, Calif.
 Overman, Vernon B., Winchester, Ind.
 Palmer, Lynn C., 2230 East Ave., R. R. No. 2, Kalamazoo, Mich.
 Perschbacher, J., 117 Dodge St., Janesville, Wis.
 Pote, Thomas B., 4925 Park View Place, St. Louis, Mo.
 Rackley, Ernest William, Box 33, Waycross, Ga.
 Rahn, Oswill B., Morgantown, Pa.
 Rowe, Taylor Prescott, 316 N. Henry St., Richmond, Va.
 Schall, J. Hubley, 350 Lafayette St., New York, N. Y.
 Schubel, Otto William, 89 E. Chicago St., Quincy, Mich.
 Shore, Chalmer Scott, Lake City, Minn.
 Starke, Charles Frederick, Chestnut Hill, Philadelphia, Pa.
 Stevens, Clarence Marshall, R. D. No. 4, Towanda, Pa.
 Wilson, James B., St. Croix Falls, Wis.
 Woolen, Vergil W., 618 Fifteenth Ave. N., South St. Paul, Minn.

The amount which shall accompany an application filed this month is \$7.08, which covers membership fee and dues to January 1, 1929, including subscription to the JOURNAL.

COMING VETERINARY MEETINGS

Connecticut Veterinary Medical Association. Bridgeport, Conn.
 August 1, 1928. Dr. E. H. Patchen, Secretary, Milford, Conn.
 Chicago Veterinary Society. Great Northern Hotel, Chicago,
 Ill. August 14, 1928. Dr. J. B. Jaffray, Secretary, 2956 Wash-
 ington Blvd., Chicago, Ill.
 Southern California Veterinary Medical Association. Chamber
 of Commerce Bldg., Los Angeles, Calif. August 15, 1928.
 Dr. W. L. Curtis, Secretary, 1264 W. 2nd St., Los Angeles
 Calif.
 Kansas City Association of Veterinarians. New Baltimore Hotel,
 Kansas City, Mo. August 20, 1928. Dr. J. D. Ray, Secretary,
 400 New Centre Bldg., Kansas City, Mo.
 Hudson Valley Veterinary Medical Society. Kenozia Lake,
 Kingston, N. Y. August 8, 1928. Dr. J. G. Wills, Secre-
 tary, 122 State St., Albany, N. Y.
 Mahoning Valley Veterinary Club. Punxsutawney, Pa. August
 24, 1928. Dr. R. M. Quigley, Secretary, Tyrone, Pa.

EDUCATION FOR THE PRACTICE OF VETERINARY MEDICINE*

By D. H. UDALL, *Ithaca, N. Y.*

New York State Veterinary College at Cornell University

Recent literature on education in medical sciences impresses one with the amount of study that has been given to the subject within the last ten or fifteen years. There are many suggestions for better teaching, more effective use of knowledge, and improved methods of practice, all of which concern us.

The success of a system of medical education, or of medical practice, is measured by the effect upon the patient. Is he less subject to disease under the new order? In retrospect, few would care to set back their disease environment even twenty-five years. So far as health is concerned, both for self and for one's animals, we have advanced. The last quarter of the nineteenth century was marked by the discovery of many important laws of health, while the first quarter of the twentieth century has experienced their application. In the use of so much knowledge, confusion was bound to occur. The members of each new branch of learning are apt to measure everything by their newly acquired information, and to look upon the fundamental as outworn because it happens to be old. In the study of a newly-discovered object, the manner of its discovery is easily forgotten.

In planning a system of instruction in the practice of veterinary science, one needs to consider the materials and methods that have been used, as well as those that may prevail in the future. The chief problems of our time may be of slight importance for the generation who are now students. Methods of study and of research that have been highly productive in the recent past may have partially exhausted their possibilities. A disease that holds the attention of scientists of one generation may be in the hands of the sanitary police of the next, or it may be largely historical. Because medicinal herbs once included most of the remedies in the materia medica, and plant poisoning is still a final refuge when diagnosis fails, it does not follow that we should go on trying to imbibe the increasing knowledge of botany. However important or spectacular may be the control of a single

*Presented at the sixty-fourth annual meeting of the American Veterinary Medical Association, Philadelphia, Pa., September 13-16, 1927.

affection, as tuberculosis, it comprises only a small part of the disease problem of its time. By constantly watching one point, there is danger of losing the perspective. The difficulties that beset the future are best sensed by a broad interest in the present; they cannot be projected from the imagination, or from a narrow experience. Education in medical science needs to change constantly to keep pace with the shifting action of disease, but it does not require a change in its foundation.

THE PURPOSE OF THE UNDERGRADUATE CURRICULUM

In discussing this subject, Dr. Charles F. Stockard¹ recently said:

A certain group of articles on medical education usually begin with the statement that the chief object in medical education is to produce capable practitioners of medicine. Such an assertion sweeps far beyond the border of the obvious. No sane person questions the statement or is unaware of the thought conveyed.

That a similar object is the purpose of veterinary education, seems equally apparent. If we accept this view in the preparation of our undergraduate curriculum, students will arrive at commencement with a fair knowledge of their subject; they will have a foundation for their work, be it general practice, specialized practice, public health service, laboratory work, or special research. Failures are often due to lack of this basic training. Some maintain that even an added experience of one or two years in general practice is essential to a successful career in any of the special fields. This advantage is recognized by those corporations that select for special work only men who have succeeded in practice. If this conception is right, our objective is clear; it is to train men how to use their five senses in an understanding on the nature, the distribution, and the control of disease; it is not to cram them with an inexhaustible supply of facts and theories.

ATTITUDE TOWARDS PRACTICE AND THE PRACTITIONER

Within a comparatively brief and recent period, new methods of investigation have led to the discovery of cellular pathology, to the relation of bacteria to disease, and to a vast amount of knowledge of the animal body. Many of these discoveries have been made possible by the invention of instruments, and the development of laboratory technic, applied to the age-old experimental method. This sudden revelation has apparently led some to feel that the new methods supersede all others in scientific investigation; that the clinical method was all right

for the nineteenth century, but it is not precise enough for the twentieth; that observations on the sick are still useful in the palliative relief of the ailing, but the clinician and his patient are consigned to an inferior position; that while useful knowledge may come from such a source, it will be barren of fundamental truth; that the spirit of science is elsewhere; that research now occupies a higher plane.

Expressions of this view are common. In my student days, I read that the great pathologist, Robert Koch, left the practice of medicine for the higher calling of research. A member of my class in the veterinary school often remarked that he would have nothing to do with practice, for he was interested only in science. Nearly twenty years ago, one of our graduates rode with me for a few days in the ambulatory clinic. One day he remarked, "How can you do any research work and spend so much time in the clinic?" It is not rare to hear, that for a certain purpose the scientific, not the clinical, is desired. From the president of a well-known education board I have received a letter which states, "Fellowships are confined to a strictly limited number of men who are on the *scientific side*, engaged primarily in research." Since the candidate whose application was denied was a clinician, the distinction is obvious. From a member of the American Veterinary Medical Association who ranks high as a research worker, I have this illuminating phrase: "The semi-scientific presentations such as practitioners appreciate and readily grasp." On this conception, one finds numerous comments. Those that follow are selected at random.

Dr. Wm. J. Mayo² says:

Today one may say truthfully that medical researches designed to relieve generations yet unborn are looked upon as being almost holy in conception, whereas the relief of people who are miserable and suffering is too often looked on as sordid and commercial.

Dr. Arthur Dean Bevan³ states:

It seems difficult for some minds to comprehend the fact that a clinical teacher can spend his life in the wards and private rooms and laboratories of a hospital . . . and yet devote his life to clinical teaching and research just as completely as does the physiologist in his class room and his laboratory.

Quoting Dr. James B. Herrick⁴:

Clinical medicine—using medicine in its broader sense as including medicine, surgery, obstetrics, and the specialties—should also be presented to our students by one who is himself a clinician, a practicing doctor. Such a teacher should be well informed as to facts, well trained as to methods. He must be an expert in the application of his knowledge in diagnosis and treatment. He is intellectually as scientific as his laboratory or all-time colleagues. Dr. Flexner's analysis of this point in the early pages of his recent book on medical education is illuminating, and is

comforting to physicians who have felt long the injustice of the too prevalent attitude of supercilious superiority assumed by some laboratory workers. To immerse oneself in a hospital or laboratory does not of necessity make a man a scientist. Nor does a man who engages in practice by so doing necessarily lose his scientific habits of thought.

Sir James MacKenzie⁵ says:

Until recent years, the teachers of medicine, and those who have done so much to advance our knowledge, have been, to all intents, general practitioners, such as Harvey, Hunter, Jenner, and many others. With the development of laboratory methods, and the influence they have had on medicine, the notion has risen that progress can only be made by their use. Therefore, all facilities have been given to those who could use these methods; indeed so little was it realized that the general practitioner only had opportunities for exploring fields essential to the progress of medicine, that his education was never directed towards equipping for such work, while it was impressed on him, that for research, special methods and facilities were necessary from which he was excluded.

Dr. Abraham Flexner⁶ writes:

Science resides in the intellect, not in the instrument. To call a careful and correct bedside observation clinical and a laboratory examination scientific, as if there were some qualitative distinction between the two, is absurd. . . . The clinic is scientific, not merely insofar as it utilizes chemical or physical methods and technic, but primarily because it represents a determined, fearless, and painstaking effort to observe, to explore, to interpret, to unravel. It is not saved to science by laboratory methods; it includes them as simply additional weapons with which to do better what scientific clinicians have always done, viz., observe, explore, unravel

There is a wide spread impression that the scientific quality of medical education and medical practice is in some fashion dependent upon the part played by the laboratory. This is not the case. Science is essentially a matter of observation, inference, generalization. The mind of Sydenham, interested in a sick child and humanely preoccupied with its care, did not, insofar as it functioned scientifically, operate differently from that of Galileo, interested in cosmic physics.

Not only is the part played by the active senses the essential criterion of science; one may go further—the vast and complicated paraphernalia of science are merely means of extending their scope.

That clinical observations have introduced new eras in medical progress is well illustrated in the following quotation from a Harvey Lecture by Dr. Faber,⁷ of the University of Copenhagen:

In France at this juncture there were more especially two men who endeavored to plan out the lines of modern therapy. Their significance lies primarily in the fact that they discussed the method to be adopted in order to promote therapeutic progress. These men were Louis, the founder of medical statistics, and Magendie, the creator of modern experimental physiology.

Louis was a clinician and with Laennec and Anfral was one of the pioneers of the scientific school which at the beginning of the nineteenth century founded our present nosography. . . . His therapeutic efforts must be noted in connection with his task to establish definite entities of disease, actual diseases instead of the predominant symptom-atological chaos in which the description of disease then found itself.

In 1728 and following years Louis then endeavored to investigate more closely the effect of bleeding by calculating in about 150 cases how the course of the disease progressed in cases where the bleeding was carried out at the initial stages of the disease, that is during the first few days, and cases where it was not undertaken until late in its course. . . . He discovered that the bleeding had no effect whatever on the course.

The tremendous sensation it caused elicited a violent stir in the whole of the medical world. . . . At every bleeding in acute cases, for instance pneumonia, a buffy coat on the blood was observed to form, a proof positive that a harmful substance was being removed.

The occurrence of a buffy coat is merely an essential sequence of the morbid state, not its cause, but if we observe the part it has played in the history of medicine, *we get an idea of the enormous significance general pathology has had and still has in respect to the practical art of healing.*

Since the time when Louis brought science to the clinic, it has been the final testing-ground of all cures. Long before bacteriology was established, clinicians knew that many diseases were infectious, and some of them they controlled. Clinical studies have given us the descriptions and the distribution of disease; they have revealed the results of nature's method of overcoming it, and have led to preventions and cures, as for variola in man, and milk fever in cows.

From the foregoing quotations it is apparent that leaders in medicine vigorously oppose the suggestion that practice is barren of either science or discovery.

THE CURRICULUM

I have discussed at some length the purpose of the curriculum, and certain conceptions of medical education as expressed by leading authorities. Conceptions are of more importance than the curriculum, for they determine the organization of the school, the relative support of the various departments, the attitude of the teacher, and the aspirations of the students.

Because of the years of study and experience that the medical curriculum represents, it is included here for comparison with our own, without reference to direct application to veterinary medicine, but to show the relative amount of time given to each group of subjects, and the kind of teaching material employed. For the technic and methods followed in control of diseases of animals are the same as those used by physicians, and a system of teaching that has proved to be satisfactory for one will probably be a success with the other. I have followed the general custom in the use of the terms preclinical, clinical, and educational. The Cornell Medical and Veterinary schools are chosen for comparison. It is probable that any other two representative institutions would give similar results.

The following medical curriculum is also reported from the Proceedings of the Thirty-sixth Annual Meeting of the Association of American Medical Colleges:

SEC. 5—CURRICULUM. The entire course of four years shall consist of from 3,600 to 4,400 hours, distributed as from 900 to 1,000 hours per

	MEDICAL (HOURS)	VETERINARY (HOURS)
A Educational Subjects		
Botany.....	0	128
Zoology.....	0	96
Human Hygiene.....	0	64
Totals.....	0	288
B Preclinical Subjects		
Embryology and Histology.....	258	296
Anatomy.....	474	688
Chemistry.....	239	135
Chemistry, Milk.....	0	72
Physiology.....	318	260
Pharmacology.....	110	216
Pathology.....	319	336
Bacteriology.....	210	224
Animal Husbandry.....	0	128
Parasitology.....	0	72
Totals.....	1928	2427

[illegible]

TABLE IIb—Curricula of the Cornell Medical College, and the New York State Veterinary College, Cornell University (continued)

	LECTURES AND RECITATIONS	CLINICS	LABORATORY
C Clinical Subjects, Veterinary			
Medicine.....	192	40	
Surgery.....	128	192	48
Obstetrics.....	64	40	
Small Animals.....	32	96	
Poultry.....	32		
Autopsies.....		24	
Jurisprudence.....	16		
Horseshoeing.....			80
Veterinary Hygiene.....	16		
Ophthalmology.....	16		
Totals.....	496	392	128
Grand Total... 1016			

year, and shall be grouped as set forth in the following schedule, each group shall be allotted approximately the percentage of hours of the whole number of hours in the course as stated.

1. Anatomy, including Embryology and Histology.....	14	—18½%
2. Physiology.....	4½	—6%
3. Biochemistry.....	3½	—4½%
4. Pathology, Bacteriology and Immunology.....	10	—13%
5. Pharmacology.....	4	—5%
6. Hygiene and Sanitation.....	3	—4%
7. General Medicine.....	20	—26½%
Neurology and Psychiatry		
Pediatrics		
Dermatology and Syphilis		
8. General Surgery.....	13½	—17½%
Orthopedic Surgery		
Urology		
Ophthalmology		
Otolaryngology		
Roentgenology		
9. Obstetrics and Gynecology.....	4	—5%
Total.....	76	—100%
Electives.....	24	—0%

When the teaching conditions demand it, a subject may be transferred from one division to another.

Candidates for admission to the medical profession must have a bachelor's degree, while candidates for admission to the veterinary profession must be high school graduates. The University requires of a medical student the liberal culture and general education implied by a college degree in Arts or Sciences.

Let us first compare the educational and preclinical subjects, where the veterinary curriculum has an advantage of about 787 hours. On a semester schedule of fifteen hours a week, this is

the equivalent of almost two years. If the hours devoted by the veterinary student to preclinical subjects could be limited to those of a medical student, either his general education or his clinical training might be considerably advanced. The difference suggests several explanations.

First, since the medical student is required to take chemistry and other science in his bachelor's course, one might suppose that it would give him certain premedical credits that *must* be earned by the veterinary student after he enters the veterinary school. In the catalogue of the Cornell Medical College the following entrance requirements are specified: physics, 8 semester hours; English, 6 semester hours; modern language, 6 semester hours; chemistry, 12 semester hours; biology, 6 semester hours. Of the first three, none is included in the veterinary curriculum. In chemistry, the veterinary curriculum contains fewer hours than the medical curriculum. In biology, the bachelor's course includes six hours, with a statement that embryology and histology are desirable, and that courses in comparative anatomy of vertebrates and elementary histological technic are recommended. This six hours of biology may be considered a duplication of the zoology in the veterinary curriculum. The extra 787 preclinical and educational hours in the veterinary curriculum are not devoted, then, to the study of specified subjects required of the medical student in his bachelor's course. The only subject common to both courses, in which the medical student must spend much more time, is chemistry. The veterinary curriculum may be credited with 288 hours in the educational group, 128 hours of animal husbandry that may be placed in either group, and 371 excess hours of preclinical time as compared with medicine, a total of 787.

A second explanation is that the work for the bachelor's degree gives the medical student a higher average capacity, thus making it possible for him to progress more rapidly. Doubtless this explanation is true, but it does not explain why he requires twice as much time to cover the clinical subjects. If the four years of high school work now accepted for entrance to the veterinary college are insufficient, it is probable that additional education should be obtained before, rather than after, entrance to the veterinary college. Yet we have examples, as in Engineering and Architecture, where English and other similar subjects are taught during the professional course. To require of the veterinary student one or more years of collegiate work

would lead to a marked increase in the quality of the graduates of the veterinary colleges. If the entrance requirements were increased, would the time devoted to preclinical subjects be reduced?

A third explanation is found in the variety of animals encountered by the veterinary student, who must learn the anatomy and physiology of the horse, cow, sheep, swine, dog, and fowl. This reasoning is somewhat specious and, like the preceding paragraph, it does not explain why the medical student requires twice as much time to cover the clinical subjects. It is probable that the variations between the species are more abundant in disease than in health.

A fourth explanation is found in the theory that the requirements of the veterinarian are fundamentally different than those of the physician and that an entirely different relationship exists between the so-called laboratory subjects and the clinical subjects. If this view is accepted, the object of the undergraduate curriculum, "to train men to be practitioners," needs revision.

A fifth explanation rests on circumstances. In the founding of state schools funds have been limited, and it has been less expensive to make adequate provision for such subjects as anatomy, chemistry, physiology, etc. Thus this side of the growth has been relatively easy, and the veterinary school has developed around the laboratory. There follows the possibility that in some instances the needs of the clinical subjects have been judged by the light of laboratory experience alone. In the change from the old private school, where chief emphasis was placed on the patient without due regard for education or training in basic sciences, it is possible that the pendulum has swung too far in the other direction and that too little emphasis is placed on the clinical aspects of disease.

A marked difference is also found in the schedules. In the medical school the student completes his premedical work at the end of the second year, leaving two years free for clinical studies. In the veterinary college the clinical studies begin with the third semester, and they are then interspersed with preclinical studies until the last day of the course.

The difference in time devoted to clinical subjects by the veterinary and medical schools may be variously explained. Medical education represents years of development; it has outgrown the influence of circumstances and approximates what is

regarded as desirable. Its different departments are balanced. The necessity for clinical material, and facilities for its use in teaching, study, and research are recognized. The clinic is the goal to which all other courses lead; it determines the location, for medical schools must build where the sick are to be found; its size and its appointments determine the opportunities of the other departments, as well as the reputation of the institution.

Clinical departments in the veterinary school are conceived and planned in an entirely different mold. To make a clinic pay is a major virtue, and to utilize it for research is a strange notion. The following quotation from Flexner⁷ hardly applies to the veterinary clinic:

With the growing, even though still limited, acceptance of the notion that it is the function of the university clinic not only to treat patients and to train students, but to investigate disease, the clinical laboratory of the past decade has proved inadequate. It has, of course, not lost its place or importance—for it is still needed for diagnosis and for the training of students in methods. But as matters now stand, neither independent, nor coordinated departments of pathology, bacteriology, and biochemistry can take the place of research laboratories in the clinic equipped for the study of problems found in the clinic.

The "clinical laboratory of the past decade" is a future hope in veterinary education, and to a large extent this is true of "coordinated departments of pathology, bacteriology, and biochemistry."

In this country liberal appropriations have been made for the control of animal diseases, and for research in veterinary medicine. With the exception of the clinical departments our better schools compare favorably with medical colleges. Is it not fair to assume that our own conceptions are in part responsible for the difference, and for the common effort to teach the application of veterinary science to the animal-owner?

Without further discussion of this complex question, I will close with one more quotation from Flexner:

On the ground of the increasingly successful effort to expel superstition, speculation, and uncritical empiricism from medicine, and to base both knowledge and practice on observation, experiment, and induction, the present volume discusses the science of medicine. In using the term in this guarded sense no distinction can be made between research and practice. The investigator, obviously, observes, experiments and judges; so do the physician and surgeon who practice their art in the modern spirit. . . . To the foregoing discussion, objection might be made on the ground that, after all, the question is one of definition without practical importance. Without doubt, it is a question of definition, whether medicine be or be not classified as a science. But definition in this instance is far from being devoid of practical significance. If medicine is classified as an art, in contra-distinction to a science, the practitioner is instructed to proceed with a clear conscience on superficial or empirical lines; if, on the other hand, he is acutely conscious of a responsibility to scientific spirit and scientific method, he will almost inevitably endeavor

to clarify his conceptions and to proceed more systematically in the accumulation of data, and the framing of hypotheses, and the checking up of results.

In this brief discussion I have attempted to compare conceptions and methods of veterinary education with those of human medicine. Three distinct differences are found: (1) the educational requirements of the medical school are much higher than those of the veterinary college; (2) the preclinical curriculum in the veterinary college is more extensive than that of the medical school; (3) the clinical curriculum in the veterinary college is much less extensive than that of the medical school.

REFERENCES

- ¹Stockard, C. F.: *Jour. Amer. Med. Asso.*, lxxxvi (1926), p. 1508.
²Mayo, W. J.: *Jour. Amer. Med. Asso.*, lxxxviii (1927), p. 1377.
³Bevan, A. D.: *Jour. Amer. Med. Asso.*, lxxxvi (1926), p. 594.
⁴Herrick, J. B.: *Jour. Amer. Med. Asso.*, lxxxvi (1926), p. 1.
⁵Mackenzie, Sir James: *The Future of Medicine*, p. 10.
⁶Flexner, A.: *Medicine and Medical Education*, p. 6.
⁷Faber: *The Harvey Lectures*, 1925-26.

DISCUSSION

DR. W. A. HAGAN: I think it is very unfortunate that the distinction between the so-called laboratory worker and the clinician was ever made. We all know that there is more or less bad blood between some laboratory workers and some clinicians; that some look upon the other group with more or less contempt, and vice versa. Dr. Udall quoted some individual who had made a somewhat contemptuous statement regarding the practitioner. I do not think this statement can be regarded as representative of the opinion of the laboratory workers in general. At the same time, I could cite him statements—and I do not think it would be necessary to cite many—where clinicians or practitioners have a tendency to look with some scorn on the laboratory worker.

I happened to be in Dr. Udall's office some days ago when he was working on this paper, and I discussed some of these things with him. I do not think the comparison he gives of the curricula of the Medical and Veterinary schools of Cornell University is quite fair. We know that a few years ago the curricula were very much shorter than they are at the present time. The problem is coming up, and is increasing each year, as to how one is going to give, in the time he has available, even a basic knowledge of the science of veterinary medicine. I think many teachers try to incorporate too many of the details and not enough of the discipline of thought. We can not give all the details in the time given, but there are certain basic things which are constantly coming up, so I submit, the material which must be given to a veterinary student is very much greater today than a few years ago.

Now, in the upper part of his chart down to the point where he uses the word "clinical," the subjects are identical in all medicine, veterinary or human. In the upper group there are infinitely more workers, more capital and more support has been given in the past, and I believe that knowledge of that part of the subject has increased faster in the last decade or so than of the subjects given in the second part. I see no reason then, why the hours in these subjects ought not to be approximately the same in the Medical and Veterinary schools.

Now as to the lower part, the clinical medicine, if you are considering only medicine, surgery and obstetrics in this category, I see no reason why they should not be approximately even, but I may be wrong in this. At the time I was discussing it with Dr. Udall, he included in the 2243 hours in the medical curriculum, which is practically twice the veterinary, such subjects as pediatrics, 200 hours, psychiatry—I do not remember the number of hours—neurology, and several others. These are subjects in which there has been a great deal of progress made in human medicine and, so far as I can see, they have at the present time very little application in veterinary medicine. Now

if he had subtracted these subjects from the medical side—I can not see how they can with fairness be put in there, when comparing it with the veterinary curriculum, since there is practically no information on the veterinary side. I think we would have had the totals more nearly alike.

DR. V. A. MOORE: I think, in making the comparison between medical and veterinary curricula, that we have got to take into account that one factor which Dr. Udall brought out very clearly here, and that is the difference of the preparation of the men to begin with. In human medicine, especially in the school where the comparison is made, when the man begins to study medicine, he is a graduate. He has had his chemistry as a prerequisite study, that is, the ordinary chemistry. What he gets in the Medical School is more applied physiological chemistry. He has had a great deal of the other basic sciences. In other words, he is better prepared to take care of these studies than the veterinary student coming from a high school. I do not know just how we are going to allocate those different qualities, but I think that eventually the time will come when men will get good education and then study either veterinary or human medicine. The study of cultural subjects, as it exists in many of our curricula, does not seem to work out very satisfactorily. Men who come to work in bacteriology and pathology, that have a direct aim toward acquiring knowledge on which the clinical education is founded, are bound to be well prepared on those subjects. I say that because all our great technicians were men who were experienced in laboratory work, and they got that fundamental knowledge by which they were able to interpret clinical subjects. As they pointed out at one time, when we know our pathology, we will be able to translate the changes that take place from the symptoms; but until we know more about it, we can not do it.

Now I feel that Dr. Udall is very right in feeling that there is just as much scientific work, just as much research work, in the clinic as there is in the laboratory; but, in order to have clinical work scientific, it must be based on fundamental facts and these are facts regarding the conditions with which you are dealing. Now it is not scientific not to try in any way to find out the cause of the cure, etc., but the scientific clinician would find out whether it was due to any parasite or fungus before he understood the other. It is largely an attitude of mind, and the background of knowledge by which you go at this work. Uncorrelated observations do not amount to much. We have had those for all these centuries, and progress is being made and scientific work is being introduced into clinical medicine just as fast as we can get these great discoveries in physiological chemistry, bacteriology, pathology, etc. The clinic must be faced, otherwise you can not interpret the symptoms. It gets back to the same thing that practitioners have felt in regard to laymen testing their cattle with tuberculin. Anybody can inject it, but you have got to have some knowledge of this subject in order to interpret the results, and the error comes in the interpretation. Consequently the background of technical knowledge is necessary, and I think that the great problem that is before us, before men who are interested in building up better veterinary education, is how to get this background of knowledge, separate it out and get that fixed, before we take up the real professional subject.

Now it is not a problem only in veterinary education. The engineers are doing the same thing. They are building a curriculum in some places of culture and engineering. Some say it works and some say it does not. Our experience is that they do not blend well with technical work, and so, in order to get this background for the clinical work, it seems to me we must get the basic subjects, and I feel we ought to get them before we get into the professional work.

DR. R. R. BIRCH: I never have been one to draw very close distinction between clinical and laboratory methods. All are aiming at the same thing and, while we may make a rather rough distinction, after all, we can separate those two things only artificially. I never heard that more forcibly brought out than it was in a remark which I heard Dr. Marek, of Budapest, make. Before I reached Budapest, I had heard considerable praise of his ability as a clinician and diagnostician, and when I arrived I talked with men in the pathological department first. They and others had nothing but praise, concern-

ing Professor Marek's diagnoses. He sometimes failed to make a diagnosis in his work, but when he made one, it usually was correct. When I met Professor Marek, I congratulated him on the proficiency which he had attained, and he replied: "That may be true now, but it is true because I have had the laboratory as my teacher for a great many years." That, I think, sums up the whole thing. Laboratory and clinical methods together, and when we begin to pull them apart, each field suffers.

DR. H. E. BEMIS: I hesitate to discuss this paper because I heard only a very little of it. I imagine that one of the points which Dr. Udall was making was the necessity of having the use of laboratory facilities and methods, to facilitate the making of proper diagnoses on clinical cases.

Now there is no question in my mind—I do not think there should be anywhere—but that we must have thorough training in the fundamental subjects. When we get to the clinical work, we need those same subjects on which to base our work. As I see it, the problem of the clinician and a clinical staff, which is usually undermanned, is how to do the work which must be done and still be able to get the laboratory work done. In order to do that, as most clinics are organized, the clinician asks the bacteriologist or physiologist to make certain examinations for him; and that is the way we have been doing, and it has been a great help to the clinic; but the trouble is, when the dean asks the pathologist or the bacteriologist to take up a special problem, he says: "I haven't time for that, I am covered up, doing work for the clinical staff." Of course, that is all well and good, that is probably true, and it seems to me the only question is, what kind of an arrangement should we have in order to have the fundamental work well taught, have what research work is necessary carried on, and still have the same kind of work available for the clinical staff. I do not believe you can tie up in any one man a complete knowledge of all subjects. It can not be done in a clinic. He can not handle the cases which he must handle from day to day, and still be an authority on laboratory technic, but I can well see how Professor Marek has learned—he has always had the backing of the laboratory diagnoses—to make his diagnoses from a clinical standpoint in the clinic and get them very nearly right. After you have seen a few hundred tumors, for instance, and have made your own clinical diagnoses and have sent them to the laboratory and find your diagnoses checked there, after a while you get so you can recognize a certain kind of tumor from its clinical aspect. The same thing is true of other kinds of work.

Now it seems to me we should have our fundamental subjects going on as they are and extended in their own way from their own advantage, but in some way have that same arrangement available for the individual use of the clinical staff. Whether those men should be placed directly in the clinical staff and what the internal arrangement should be, I do not know, but I know what I would like to have. I would like to have a whole staff of my own.

DR. W. L. WILLIAMS: It has been my experience, as a clinical teacher, that it is impossible to make use of the volume of clinical material which is presented, and that the members of the staff of the Pathology and Bacteriology departments have always been too interested in their own affairs, so that it has always been with reluctance that I have piled any work upon them. They always have their hands full, and while they have always been very courteous to me in anything which I have requested, I have not presented nearly the material to them that I would have done, had I not known that they were thoroughly engrossed with their own affairs; and it seems to me that, as Professor Udall has intimated, one of the greatest defects in veterinary education is the want of laboratory facilities which are directly and wholly available to the clinics. That is not saying anything against the laboratories of pathology and bacteriology, whatever, but I do feel that the clinician should have a more intimate source to which he can go for aid in the matter, and not have to appeal to another department and interfere with the ordinary work which is always upon it. I have always felt that very strongly, and it seems to me that one of the most important things we can possibly consider in connection with veterinary medicine is that the clinical teacher is to have at all times the direct control of a sufficient staff to conduct the laboratory work.

I still keep in touch with the College, and I often regret to see the enormous waste of material, which it is almost beyond power to value. They do not get, I think, a third or a fourth of the value of the cases today. I think that is a difficulty among all the veterinary colleges of America. We are not getting enough scientific study in our clinics, simply or largely because of want of sufficient aid in the laboratory. I would like to say in regard to Dr. Hagan's remarks, concerning pediatrics, that pediatrics is not in veterinary medicine to any material degree, because we have never given to the subject of diseases of young animals that attention which it deserves; and Professor Udall, in some of his work in regard to the handling of calves especially, has done a very notable work, and there is a large amount of research work to be done in that connection. I have taken occasion, in a number of cases, to point out that the future of a young animal is dependent to a large degree upon the character of its health during its nursing and milk-feeding period. We ought to have more knowledge regarding the diseases of young animals, and we should have more knowledge regarding the influence of the diseases of the young animal upon its efficiency when mature. So that, while we have neglected the subject very much to the detriment of the live stock industry, the problem is there, but, with minor exceptions, is not taken up as an important study.

DR. MOORE: I do not think there is any fundamental difference as to the excessive time in one department over the other. Science is the orderly arrangement of facts; if you get the facts, you can proceed in order.

I see there are a number of men here who are interested in college administration. The question is to obtain appropriations to establish this work on a satisfactory basis. I do not think there is doubting of the statement made by Dr. Udall that in clinical work there should be a man who can make laboratory examinations, that is, do the things that take time and which the clinical man can not do because of the lack of time.

This waste of material is bound to be; you can not avoid it, until you have more help. The practical question is, where are you going to get the help, and where are you going to get the money to pay for it? The money for veterinary schools comes from the legislature, and in the legislature you are dealing with farmers, lawyers, and those who know absolutely nothing about this work. The men in the research laboratories are working on their own problems. They are willing to make an examination to see whether the tissue is a tumor or something else. They can do that, but they can not carry on and make the thorough examinations that the clinical man wants, in order to explain or to find the cause of a certain symptom. There is no question at all in my mind of the importance of laboratories associated with clinics. I have been urging for some time laboratory work for clinical men, but the practical difficulty is to get the money to pay them. It is up to somebody—I don't know who—to make it clear to the men who handle the funds and make the appropriations that this kind of work is necessary.

This condition is temporary. There is no question about it. Progress is being made and after a little time, I think, we will have in our veterinary colleges, men who do clinical pathology, working under the clinicians, with the clinical point of view. This is going to come, but, for the moment, there are practical difficulties in getting the money. The present situation is trying but it will be improved in the future.

DR. HAGAN: I want to refer to one thing that Dr. Williams has said. If I said that the subjects of psychiatry and pediatrics and neurology, etc., were not applicable to veterinary medicine, I did not mean to do so. The point that I meant to bring out was that these subjects have not been developed sufficiently in veterinary medicine, so that at the present time there is any justification, so far as I can see, for giving them the comparative time which is given them in medical schools. I was merely pointing them out in an attempt to justify the difference in the total number of hours as given in the chart.

Another matter: It seems to me that the men in the veterinary schools might very well make use of the veterinary students for much of this laboratory work. In some of the European colleges, the students are required to do a great deal of laboratory work of their own. Professor Fröehner, of Berlin,

assigns a student to a case and requires him to do such things as feces examinations, carry out the routine urinalysis and make blood examinations that would seem to be indicated, and bacteriological examinations. They were simply assigned to the subject, and they got out of it whatever they could. Now, if the clinical students were assigned this material, it seems to me, a good deal might be done, even if the finances of the institution would not permit of obtaining a trained man. A trained man obviously is the best kind, and I think no one would deny that.

There is an intimate relationship between these basic subjects and the clinic. Referring to the meaning of the term "clinical," I hold that bacteriology, for instance, is in many of its phases a clinical subject, in the same sense that medicine is. If you are dealing with a living animal, that is clinical, as I take it, whether it is a subject to be discussed in medicine or to be discussed from the bacteriological viewpoint. They are both dealing with a sick animal.

DR. C. A. CARY: I may have some rather eccentric views about modern methods in the teaching of veterinary medicine. After a number of years in practice, and also in college work, I have come to the conclusion that the modern colleges are running too much laboratory work for practitioners. Now I do not think that we are going to make a technician out of an ordinary graduate, in all of the departments and laboratories that are found in the average veterinary college. I think we are making a mistake, and that is one reason why a great many of the practitioners who are graduated at veterinary colleges throughout the country are not properly trained when they come out. Take the medical practitioner. Does he do all his laboratory work? No. What does he do? He sends the material to the laboratory and has it worked out there.

The college attempts to make a diagnostician, to make all his tests, bacteriological and all others. If you expect him to do all that you are mistaken, because he is not going to do it. He does not have time for it. He may do it, after he gets a large practice, so that he can employ a technician.

Now I believe we must get our men back in contact with animals. You know what they are doing in human hospitals. They are making their internes get into contact with the actual patient. How many men can go out today and do an ordinary diagnosis on a living animal, unless he has a lot of stuff with him? He goes back to the laboratory to do it. We must get back to the animal. Our modern graduates lack the contact they must get in no other way than by experience. You may say this is theoretical. Maybe it is, but I say it is practical and if you do not get back to that, you are not going to turn out practical graduates who can go out and compete with the experienced practitioner.

CHAIRMAN PICKENS: This is a most interesting discussion, but time is passing and we must get along with our program. Dr. Udall, will you close the discussion, please?

DR. UDALL: I had no idea that this paper would excite so much discussion. Some of the difference of opinion is perhaps more apparent than real. Literature on medical education presents terms and topics as used by educated men throughout the world. In my paper I have followed the usual custom—educational subjects, premedical, preclinical, laboratory subjects, and clinical subjects. All have a definite meaning in medical literature; and one can hardly discuss the subject without using them. The distinction between a clinical diagnosis and a laboratory diagnosis is not a part of the subject. The extent to which bacteriology and medicine are clinical studies is not a part of the subject. In standard literature on medical education, however, the subject of bacteriology is listed in the preclinical laboratory group, and medicine is listed in the clinical group. They appear to have found a definite place and a definite relationship in our curricula. The physician uses bacteriology, and the bacteriologist uses the clinic. In this paper I have tried to show the number of hours that students in veterinary and medical schools are required to give to the different subjects, including medicine and bacteriology, which is an entirely different topic.

We have been told that in certain European veterinary schools, the clinicians have profited greatly from laboratory facilities. I believe that a care-

ful reading of my paper will reveal a suggestion that laboratory facilities for clinicians in American veterinary schools will be equally profitable. The laboratory that one finds in Professor Marek's department in Budapest, and in Professor Fröhner's department in Berlin, does not, I believe, have a counterpart in any American veterinary college.

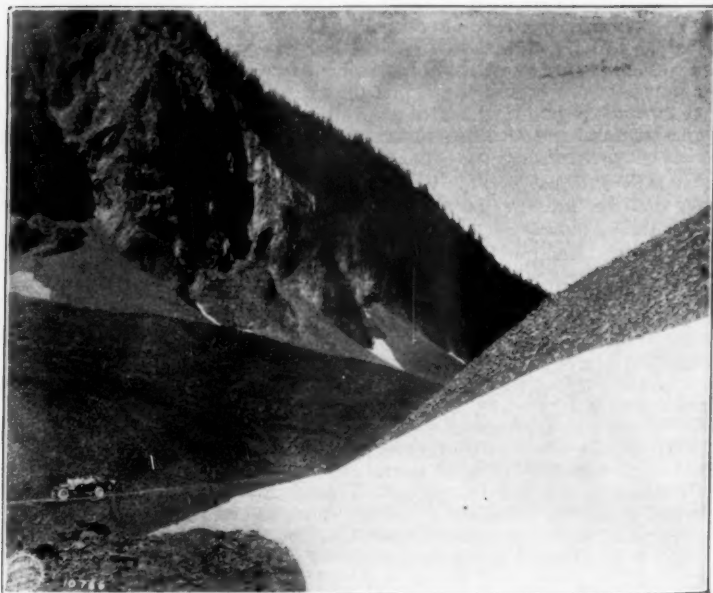
There has been no effort in the preparation of this paper to stress remarks inspired by jealousy or contempt of one group against another. But, as it affects education, it is desirable to discuss conceptions.

To attempt to draw exact comparisons between human and animal diseases for the purpose of adjustment of a curriculum is a waste of time. I am not able to recognize any unfairness in printing, side by side, a veterinary and a medical curriculum. It may well be questioned whether there is any important fundamental difference between the diseases of men and animals, or whether one is more difficult to solve than the other. So far as pediatrics is concerned, it is relatively as important in veterinary medicine as in human medicine. The death rate in young animals is certainly higher than in children.

I believe that we should study disease as it occurs naturally in a more thorough manner, and that we should bring to this study all of the facilities that science and research have given us. I am not prepared to say that, with our present facilities and clinics, there should be any marked addition of hours to the clinical group of subjects in the veterinary schools. The fundamental truths of pathology, bacteriology, and physiology are no less abundant in the clinic than elsewhere, but as Flexner has pointed out, they are not revealed to an empiric conception.

Minneapolis, City of Sky Blue Waters

ON THE WAY TO MINNEAPOLIS



The Cody Road crosses over the Absaroka Mountains at Sylvan Pass, where the snow lies all the year around.

OBSERVATIONS ON CANINE OBSTETRICS*

By J. A. CAMPBELL, Toronto, Canada

All breeds of dogs are liable to dystokia. There is no variety that will not provide cases of difficult parturition, but the condition is very common among dogs of the short-faced and round-headed varieties, with which features are usually allied thick necks, wide shoulders, and short backs; in other words the dogs whose bulk is at the front end such as English and French bulldogs, Boston terriers, Pekes, toy spaniels and pugs. The different toy breeds, owing to their smallness of physique, contribute many cases of difficult birth.

Among these breeds there is a distinct tendency towards defective hind quarters. We find straight, loosely formed hind legs, dislocations of the patella joint and shallow ossa innominata, all of which seem to be nature's reaction against artificial standards, since they constitute a decided handicap when it comes to delivering puppies. The dog fancier has definitely neglected the hind part in his breeding operations. His concentration on the fore part has resulted in genital features which make a normal birth almost impossible for bitches whose pelvic canal has not made commensurate changes with the anterior part of the body. The system of judging the breeds that are prone to whelping troubles is intensifying and perpetuating these faults, particularly with respect to the shortness of the back which is brought about by applying the same standard for bitches as for dogs. There should be a decided difference between them in this regard. A closely coupled female of the masculine type is not a good breeding proposition, as she lacks the accommodation. Such types are inclined to be too heavily muscled in the hind quarters, which does not allow the necessary yielding of the structures at whelping time.

"Died whelping" was frequently the obituary notice of a famous show bitch that was used as a brood female.

To illustrate how extensively these dogs have increased in numbers recently, I glanced over the catalog of a 1906 dog show at which 650 entries were benched. Of these only sixty-five dogs, or exactly ten per cent, belonged to the short-faced varieties and toy breeds. This number was made up of English and French

*Presented at the sixty-fourth annual meeting of the American Veterinary Medical Association, Philadelphia, Pa., September 13-16, 1927.

bulls, Bostons, pugs, English toy spaniels, Poms, and Yorkshire terriers. The current catalog for this same show last year includes 245 short-faced and toy breeds out of the 710 dogs benched, an increase from ten to thirty-five per cent.

Take the Boston terrier for example, the most popular breed on this continent today, one of the largest representatives at dog shows and owned literally by thousands of people. This popular American dog whose basic progenitor was the English bull dog, a dog notorious for its short face, massive skull, thick muscular neck, wide chest and heavy shoulders, low front legs, roached back and narrow hind quarters—a build which so far as natural breeding is concerned shows a total lack of balance. The young

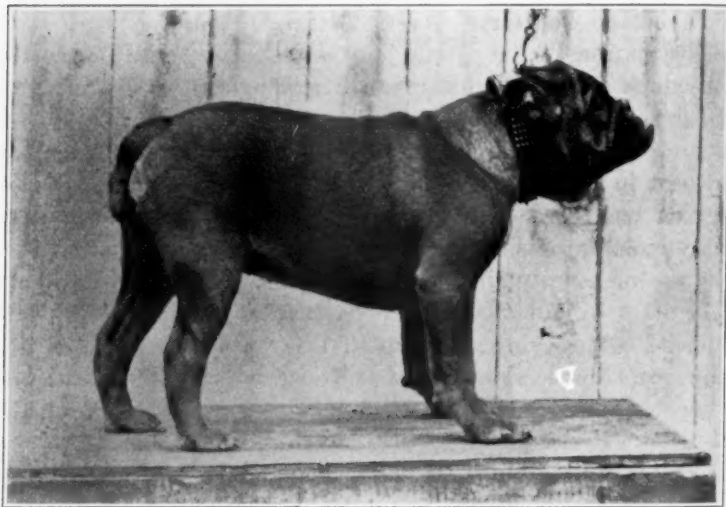


FIG. 1. A good example of a short-backed, masculine English bulldog bitch. A type that wins when showing, but is handicapped when whelping.

of the Boston, conforming to the laws of nature, tend at birth to resemble their bull dog ancestors and to be too heavily built in the fore part in proportion to their mother's genital passage.

Nowadays, the chief contributor to dystokia, apart from the usual text-book cases, such as obstructions of the genital passage in the way of growths and deformities of the pelvis due to disease or injury, is the unnatural conformation of the dam. Dog fanciers show great lack of thought in breeding females that are totally unsuitable, many of which indeed are altogether too small. The desire on the part of the public to possess diminutive specimens of certain varieties influences breeders to mate their small

females; many of which are cretins. We often see the resulting young, even before maturity, about three times the size of their mother. To breed small dogs one must take into consideration the size of the immediate ancestry on both sides for several generations back. Then again, we habitually see a well-bred bitch, that has a good head and front but is crippled behind, used as a brood bitch. Such females invariably have more or less trouble.

Physical condition of the bitch when due to whelp has a considerable bearing on the way she will stand the ordeal. It is safe to say that the majority are too fat or in poor muscular tone. The chief sufferers in this class are the family pets, as well as the lazy bitch which lies around the kennel, and the female which has missed two or three times and then conceives at three or four years of age. With such, there is a decided lack of the vitality and activity which characterize the younger bitch. With this group, which might include any breed, there is a tendency to accumulate even more fat while pregnant. They seem to give up after a few attempts at straining. The same applies to the other extreme; a thin or under-nourished bitch has a hard time, owing to debility and weakness, and tires rapidly.

The ordeal of parturition, particularly with animals with multiple pregnancies, requires them to be in the very best possible condition and muscular fettle, which is obtained only by ample and regular exercise.

Fecal impaction and a distended bladder will obstruct the passage of a fetus.

From a fetal standpoint conformation is also a decided factor at birth. A puppy of the round-headed kind with its noseless, ball-shaped head, thick neck, heavily muscled shoulders, stubby legs and cobby body, is a distinct contrast to the build of, we will say, a collie pup with its sharp pointed nose, long narrow skull, long neck and legs, and slender body. When it comes to entering and traveling through the genital funnel, the latter has every advantage and will pass out with the least amount of resistance. It is easily seen that a pup with the former build will have difficulty in securing an entrance into the pelvic canal; and when it does, the obstacles it possesses in the way of its heavily proportioned body present a further handicap to its outward journey. A variation in the sizes of the fetus occurs frequently in such a newly established breed as the Boston and one large pup among others half its size is sometimes found.

Then, too, you find dystokia resulting from misalliances. When a small bitch is mated by a dog of very much larger breed, the puppies are liable to be out of all proportion to her capacity to deliver them.

When parturition occurs with a single pregnancy, it is quite natural to assume that it will be much larger than the average puppy of a normal litter. With this condition, which is quite common with the Boston or bulldog, there is a lack of sufficient stimuli to bring on normal parturition and the period of pregnancy will invariably run over time, with resulting trouble.

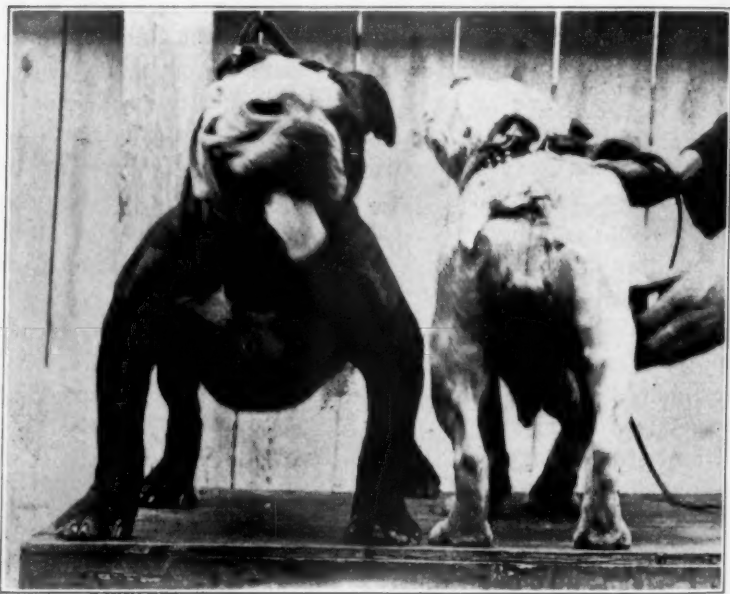


FIG. 2. Fore and aft views of a pair of English bulldogs, which illustrate why dystokia is so common with this breed.

In cases of small, short-backed females carrying a large litter, crowding will result. A puppy at the end of the horn may be lying just in front of the pelvic opening interfering with one about to be delivered.

Abnormalities of the fetus such as hydrocephalus and anasarca may increase its size to such an extent that dystokia will result. The presence of dead puppies in different stages of decomposition and the existence of infection will also inhibit the process of parturition.

Malpresentation is not so common as breeders declare it is, but the head may be turned downwards or deviated to one side with one or both fore legs protruding into the pelvic canal. The fore legs are apt to lie backward and throw the shoulder joint out, which will interfere with the passage of a pup. Transverse positions are sometimes assumed and there may be two pups simultaneously presenting themselves for birth.

Retained placenta of a previous puppy quite often occurs, interfering with the egress of subsequent puppies. Then again, an afterbirth may still adhere and hold a puppy back.

PARTURITION

Now a word or two about normal parturition at this point is in order before we take up the methods of dealing with dystokia.

When giving birth, the dog shows considerable variation owing to the many differences between the breeds. The very act of whelping varies considerably. Generally speaking, there is more excitement in young bitches or those that are whelping for their first time. Females that have had several litters may not exhibit much evidence before a puppy is born. Invariably the symptoms are a desire to make a nest or seek some place to be alone, lack of usual interest in food, panting, change of facial expression, more or less discomfiture, vulva enlarged, and the mucous membrane red, giving off a white or an egg-like discharge and the presence of white milk. This state may exist as long as twenty-four hours before a birth takes place.

Some bitches will give birth quickly, at regular intervals; others may take all day with irregular delay between births, this depending on the breed and the number of pregnancies.

The position the female usually assumes when whelping is lying on her side. There may be a few moans or cries of pain while in the act of straining, but, when a bitch repeatedly leaves the nest and places herself in the attitude of urinating, it is invariably a case of dystokia. Some owners are apt to depend too much on the time rather than on the manifestations of the female. The general idea is that a dog's period of pregnancy is 63 days. Novice breeders are apt not to concern themselves at any efforts the bitch may make before that time; attributing such efforts to false labor pains, which occur in the human but seldom in the dog, and when they have come to seek our assistance, they find, often to their sorrow, that they are too late.

The female has been, in reality, doing her utmost to expel a fetus a day or so before.

The best plan is to consider straining on the part of the female as a positive indication that parturition has commenced. Examination of the stud-book records shows us that for one thousand births the average period of pregnancy is between sixty-one and sixty-two days. Some bitches will go from 65 to 67 days and as late as 72.

A very large proportion of the puppies in multiple pregnancies come with their hind legs first. This position occurs so frequently

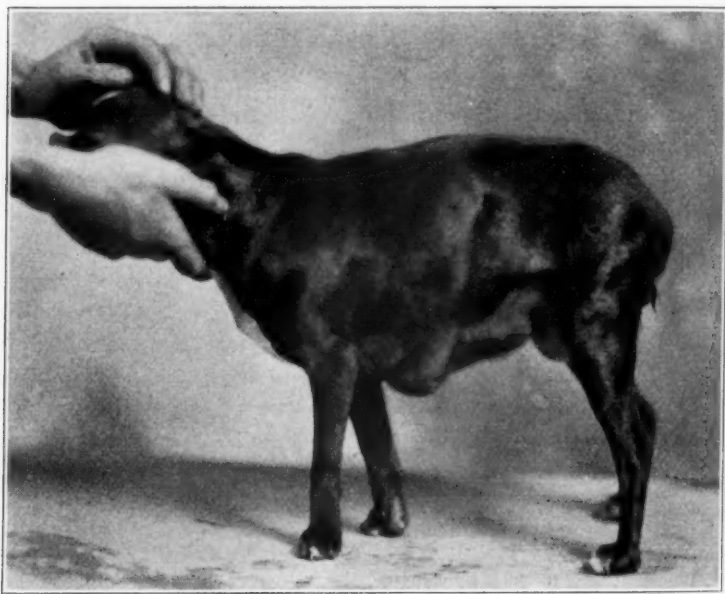


FIG. 3. An undersized Boston terrier, a decided cripple, used as a brood bitch, as she was so well-bred.

—in fact possibly between thirty and forty per cent of the cases—that it must be considered almost a normal case.

It has been said that a fetus will not live long when the membranes have ruptured. I have known several pups to live fifteen hours. This, of course, depends on the amount of straining that has taken place and the nervous temperament of the female, also whether the placenta is still functioning in its place and the amount of fluid present. Puppies delivered, whether naturally or artificially, before the fifty-ninth day, invariably die unless

kept by themselves in very warm surroundings and held on the bitch while nursing, when there is hope of saving them.

With dogs larger than the Boston, there is difficulty in determining whether the uterus is empty. One has to be very careful that no pup remains or not to make too positive a statement to this effect. Some bitches may retain a pup or two, carry them for several days and seem normal, and without ill effects finally deliver them. The continuance of a blackish-green discharge and the slightest sign of straining are very sure symptoms that something remains, either a pup or afterbirth. The owner should always be warned to report the slightest condition of this kind. But, generally speaking, when there is anything left it is quite obvious, as the bitch loses appetite, shows little interest in her pups and rapidly becomes toxic.

EXAMINATION OF THE FEMALE

Parturition cases may occur, of course, either at the home or in the hospital. We prefer the hospital, naturally. Every convenience is at hand and the patient can be adequately observed.

When a whelping case is brought in, the female is placed on the table for examination. The owner is asked when the bitch was due, number of services, if she has had pups before and if any difficulty with previous parturition, and if so, whether the same sire has been used, when the first signs of whelping were noticed and the extent of her efforts, when she last fed and whether she has been vomiting. We examine her condition to see if she is toxic, number of puppies she is carrying, the color of the milk, the condition of the vulva, and discharges, and the presence or not of odor, and whether there has been any attempt at delivery.

The bitch is then prepared for an internal examination, which consists of cutting off the hair from the parts, if a long-haired dog; washing and disinfecting. Exploration by the finger is made to ascertain conditions in the vagina and uterus, and the whereabouts and state of the fetus.

We may get a female that is overdue, but seemingly normal, a female that has been showing signs of parturition but without results, a female with the first pup lodged in the vagina, a female which has delivered some pups and then developed dystokia and is in good condition, or a female whose puppies are dead.

After an examination with a view to arriving at the best course to pursue, in a case of whelping, it is necessary to make up

one's mind quickly as to whether the condition of the case calls for immediate action or allows for delay.

The owner has to be considered in a large measure and sometimes requires tactful handling, particularly if he is inexperienced with whelping troubles. Any appearance of haste must be guarded against. At the same time there is danger in delay and it is not advisable to leave too much to nature, who has long since given up her interest in the domestic dog. One man may suddenly appear on the scene and say very abruptly, "Hurry up and open this bitch! I am not going to take any chances, she has been laboring for two hours," while another individual will say, late at night, "I want you just to have a look at this bitch. She has

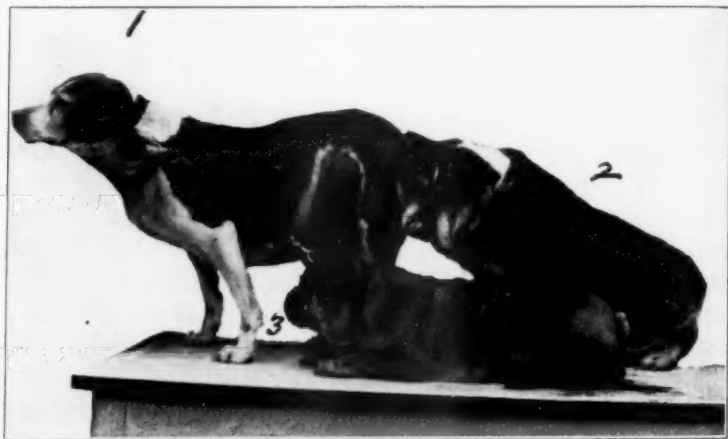


FIG. 4. Three Typical Cesareans. (1) Part Beagle and Foxhound, $3\frac{1}{2}$ year old, very fat. Confined in a small yard between hunting seasons. Bred by an Airedale. Parturition commenced on the 62nd day. She was soon in great distress. Nine living puppies were removed. (2) Registered English bulldog, 4 years old. One large fetus delivered alive on the 67th day. (3) A cretin English bulldog, 1 year old. Four live puppies.

been straining on and off all day but her time isn't up until the day after tomorrow. We want to give her every chance. She had a litter two years ago without any trouble, yet we don't want her to suffer or to lose her or any of the pups. My neighbor, who breeds Airedales and fox terriers advised me to let nature take its course; said she would have them all right. He often has bitches go overtime." We explain the condition in which we find the female and point out why we are of the opinion that she cannot deliver her young naturally, and the danger of delay, at the same time qualifying our statements that there is always the remote possibility of her being able to pass the pups, but the

risk in waiting would not warrant postponing active measures any longer. Then, if there is the indication that a cesarean operation will have to be performed, we advise him to discuss the situation with some one who has had experience with it. We have known bitches to have a natural birth when there was every indication that it was impossible for them to do so and an unfavorable impression is created in the mind of the owner.

Boston terrier fanciers do not wait very long before they seek assistance. If no puppies are born four to six hours after decided indications of whelping are noticed, or two hours after the last puppy is born, they become anxious, whereas a fox terrier or collie breeder, to whom dystokia is rare, may not seek advice for a day or so after dystokia has set in.

Nowadays, the majority of cases of dystokia that we have are bitches that have been whelping without being able to deliver any puppies at all, and it is becoming more and more the practice to deliver these by performing hysterotomy. Dog breeders who are our best customers, and also the most exacting, want results and do not wish to lose their valuable breeding stock or the puppies, upon which they have built up high hopes. They readily see the cesarean operation is the safe and sane procedure with very little danger of loss.

Breeders have reached a point of looking to us for correct advice and assistance. When anything goes wrong, it is laid at our door and the bad news soon spreads among the fancy.

ECBOLICS

Now coming to the different methods of treatment in cases where assistance has been sought, these depend on circumstances. They may be by manipulations, use of medicinal agents or ecbolics, the use of instruments or the cesarean operation.

Medicinal agents have their place in dystokia. They are pituitrin, preparations of ergot of rye, and quinin. Of these, pituitrin is the most reliable and will act promptly and effectively in some cases. We have used ergot of rye and quinin, the former with indifferent results, and none to speak of with the latter. Their use is indicated where the phenomena of parturition have started and the passage is clear for a birth, such as uterine inertia, or in protracted cases. If, on the administration of two doses of pituitrin there is no action noticed, repeated doses do not appear to improve matters and time would not permit depending on their use. Further and definite steps of a positive

nature must be taken at once if unfortunate results are to be avoided. Some years ago pituitrin was acclaimed by non-professional writers in dog journals as a solution of whelping problems. Unfortunately, it is not a complete solution by any means.

MANIPULATIONS

Very frequently puppies can be delivered with the hand by introducing a finger into the genital passage and the act of moving

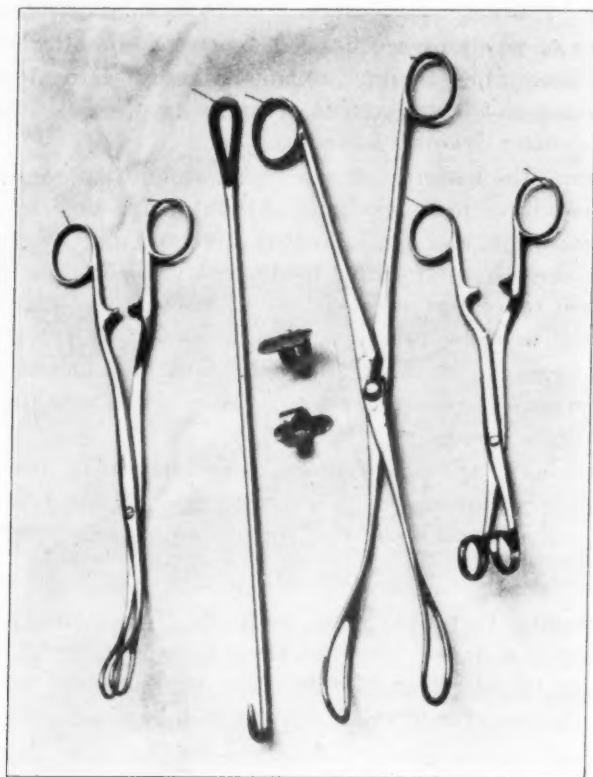


FIG. 5. (Left to right) Forrester's sponge forceps. A very useful instrument for securing a leg. Placenta burr and parturition hook. Finger grips. Corey's forceps. Their slenderness makes delicate handling possible. Ashton's pile clamps. Small, with lots of power for crushing dead fetus

it around will be the means of stimulating the labor pains, and if the fetus can be felt and made to move, straining on the part of the bitch is likely to increase. This in itself is frequently sufficient to start labor, in fact, a drive around the block in an auto or even having the bitch run up and down stairs will start the delayed birth.

By palpating and massaging the abdominal walls it is possible to propel a fetus along the uterine passage and eventually expel it. We frequently have cases where a puppy is held up and becomes stationary with its head or hind legs in the vulva region. Delivery is made by the fingers by gently pulling the protruding parts and gradually working higher and higher, at the same time assisting through the belly walls with the free hand. Where only one hind leg is felt, the other should be secured so as to distribute the strain.

It is a great help to have several pieces of soft cloth at hand while delivering pups. When it becomes necessary to grasp a fetus with the hand, it should be covered with gauze so as to obtain a firmer hold. Most puppies are killed in delivery by dislocation of the first cervical joint. This can be guarded against by securing a hold, with the finger and thumb of the left hand, on the neck posterior to this articulation. In cases where it is a breech presentation the back of the head is liable to become lodged against the roof of the pelvis. When this is found to have occurred the finger tips of both hands must be placed on either side, just in front of the pelvis, so that they feel the head and can press it through the canal. A fatality is likely to occur from suffocation with a breech presentation if there is much delay; whereas, with a head coming first, there is danger of injury where forceps are used.

INSTRUMENTS

When should we use instruments? Their use is called for where several pups have been born and dystokia occurs; where dead puppies are present; and where it is decided that it would be more advantageous to save the bitch rather than the progeny.

Before delivery is to be attempted with instruments, the back and hind quarters should be thoroughly washed and disinfected. With a long-haired animal the hair should be cut off closely surrounding the region of the perineum and the tail; and it is advisable, wherever possible, to cover the parts with a sterile cloth. Besides the instruments being placed in a mild antiseptic solution we like to have two dishes of the same solution for rinsing the hands. The bitch should be made to stand, as any other position will have a tendency to crowd the abdominal viscera into the contents of the uterus, except when an anesthetic is being used for this method of delivery.

I have made it a practice to buy every appliance recommended for canine obstetrics and have tried all kinds of hooks, snares, and forceps. Practically the only instruments I now use for delivery are forceps. My favorites for this work are different shaped human placenta forceps which I have collected while rummaging in the instrument supply houses. Corcy forceps are the ones I find most satisfactory when it comes to removing live puppies. They are long enough for the big breeds and can be used safely for the large toys. I have a pair of reduced size for very small bitches. These forceps have the advantage of being strong, though lightly constructed, with thin smooth blades, which have flexibility, a good distribution of pressure and also the advantage of being easily taken apart and joined together inside the uterus after being separately placed on the fetus.

Most of the bitch forceps are heavily made, particularly those with the inside surfaces of the jaws serrated. They are more serviceable in extracting a dead puppy. Forceps which I find very useful for this purpose are the Aston's pile clamps and I meet with more success with them when it is necessary to crush a skull or to remove a fetus piecemeal. Care has to be taken in their use, as the surfaces of the jaws are sharp at the edges.

The great point in working with instruments is to acquire the feel of things inside; to know by their touch whether they are on a part of the uterus or the fetus. It is not advisable to attempt their use until the puppy can be felt with the finger. The possibility of inflicting injury to the bitch should be uppermost in the mind of the operator. There are two safeguards. One is a well lubricated finger and the other is the free use of some mild anti-septic lubricant. For this purpose we have a grease-gun which was originally intended for packing gauze into a cavity. We also inject flaxseed tea which very closely resembles the fetal fluids. These precautions are particularly indicated where the mucosa is dry and swollen. Before exerting pressure with the forceps, the finger should always be made to feel that no part of the instrument has included any of the genital wall.

Where there is a head presentation the end of the finger should be placed under the point of the chin to close the mouth and to guide the head over the brim of the pelvis. If this last precaution is not carried out, the pressure of the forceps will cause the pup to open its mouth and the lower jaw will become jammed against the edge of the pelvis. While instruments are on the head, there is great possibility of the ear being torn off or the eyes

injured, the latter especially in the prominent-eyed breeds. With a breech presentation the forceps should be placed on the fleshy part of the leg, if possible, before any pressure or traction is made, as it is better able to stand injury than the bony structures.

It is always advisable to apply traction in conjunction with the efforts of the female and plenty of time should be taken. A good assistant can give great help by manipulating the fetus through the abdominal walls and working it along the passage.

When it is known a puppy is dead, every effort should be made to crush it as much as possible before attempting to withdraw it, and in cases where it becomes difficult to remove a dead fetus it is advisable to try several forceps of different shapes and sometimes a change of operators will meet with immediate success, as the sense of touch is sometimes lost if the hands tire. Where there is any danger of infection we always thoroughly irrigate the uterus by using therapogen, permanganate of potash or saline solutions, which should be continued if infection is manifested. The use of a general anesthetic in conjunction with forceps often works well. We have seen bitches expel a fetus while ether was being administered for a cesarean operation, prior to which there had been no results from continued straining on the part of the bitch.

In the event of retained afterbirth, it may be removed with a placenta-burr, which, on being passed well into the uterus, is gently rotated to gather up the loose shreds of the membranes until by the feel it is known that the whole mass has been wound around the instrument.

One should always consider the bitch in respect to her suffering or becoming tired, and if the operation is of long duration she should have ample rest. Quite often during these intervals the fetus may change its position and come into a more favorable position for delivery.

CESAREAN SECTION

There remains, fortunately, the cesarean operation, not as a last resort, but as a practical and humane modern method of effecting delivery of pups in cases of dystokia which would otherwise result in disaster to mother and offspring. No longer is the cesarean operation something about which you have to conquer the prejudices of the owner before he will permit its use. The good results attending this scientific method of counter-balancing the

results achieved by outraged nature in artificial breeding, as well as the causes, are now so well known among breeders, that owners of dogs, prone to whelping troubles, frequently anticipate us by requesting it. They are willing, in some cases anxious, to have it done so that they may be sure of a safe delivery. Some years ago the cesarean operation was used as a last resort. Now it is a regular and recognized phase of ordinary veterinary practice and a commonplace procedure with breeders of dogs that are prone to whelping difficulties.

The following instruments we have on hand: one surgical knife with a convex cutting surface; one blunt-pointed bistoury; one pair of blunt-pointed scissors; four artery forceps; human tongue forceps for holding uterus; Forester's sponge forceps for securing pups if necessary; needles and suturing material; 00 and 0 catgut for the uterus; Numbers 1, 2 and 3 chromic catgut for muscle walls, and waxed linen thread for the skin.

We place all dogs in a lateral position for anesthesia, with the left side uppermost. In this position the heart action may be observed and worked on in case of an accident. Animals are held by assistants; one for a small dog and two for a medium-sized or larger animal, and on occasions when short-handed, we resort to tying, which is done by applying a soft band over the lower part of the neck and another across the lumbar region just in front of the hind leg. We object to hobbling a patient to the table as it has many disadvantages. With experienced help, who understand the proper method of holding a dog, animals may be securely held, and when the violent struggling ceases, pressure is relaxed. In the event of a collapse, artificial respiration and other means of resuscitation can be quickly instituted.

We make it a practice of administering pituitrin for the following reasons: overcoming shock, contracting the uterus, controlling hemorrhage and stimulating the flow of milk.

We always enter the abdominal cavity, in a cesarean operation, through the left flank; if it is the second occasion, the right side; third, the left side again. We believe this location is far better and has many advantages over the median line. The wound has a better chance of uniting and frequently heals without interruption and if drainage is required, its position is such that it is better taken care of, and may be cleaned while the bitch is lying down. There is very little likelihood of hernia. The part is more out of reach of the puppies which should be placed with the mother as soon as her mental condition allows.

Some objections may be raised that a scar will be more readily seen. This is not so, as in most cases one has to look closely to see whether a bitch has been operated on. In the case of the median line entrance the mammae are very much in the way, and owing to a particularly active and sensitive state at the time, inflammatory processes may extend into them. By this method the position of the wound makes cleaning difficult. It also has greater weight to carry, as abdominal viscera are more likely to come in contact with the region and a hernia may readily occur and the puppies are apt to irritate the opening and annoy the mother.

An area of four inches by six inches for a Boston terrier is shaved and cleaned. While the anesthetic is being administered, the operative area is disinfected with tincture of iodine. When completed, the bitch is carried into the operating-room. The assistants stand ready to hold the patient should she move, and to handle and dry the puppies as they are taken out. Sterile cloths are placed on the bitch leaving the side of the operation exposed to view.

In making the skin incision, on a Boston terrier, the last but one teat is taken as a guide, the bottom of which should be about two inches above the border of the teats and made vertically, varying in length from two to four inches. No particular advantage is to be gained by operating through a small opening as there is always danger of tearing something.

Should a quantity of fat be found beneath the skin, it is removed and the muscular tissue elevated with a hook, and the incision continued through the three layers until the abdominal cavity is entered, with an aperture of about an inch long; and, while the muscles are still elevated, the opening is enlarged with a pair of blunt-pointed scissors. At this point a small artery may be severed and slight hemorrhage encountered, which is controlled with the forceps.

Search is now made for the end of the uppermost horn at its ovarian attachment, which is followed down until a fetus is located. It will depend now on the number present as to how much of the uterus will be exposed. If there are many puppies it will be advisable to go as near the bifurcation as possible so that both horns may be evacuated with the least effort. The use of dry gauze allows a firm grip to be taken on the slippery uterus. To open the womb, a site is selected that is not very vascular or directly over the placenta, and is made in a line with

a long axis of the organ and should be of ample size, as a right-angled tear is apt to result while withdrawing a fetus, if the aperture is too small.

Forester's forceps are applied lightly to the uterus just above the orifice, so that an assistant can hold it in such a position that the fetal fluids will drop clear of the body and not into the abdominal cavity. The pup and placenta are extracted by a steady gentle pull and dropped into the hands of the waiting assistant or some heated receptacle. When it is the latter, the pup is freed of any coverings and the mucus is dislodged from the nose and mouth by shaking the head. Afterbirths may be detached at once or at a later time. Where there is a delay or a large number of puppies to be taken out, necessitating lengthy exposure of the parts, coverings of warm sterile cloths should be used. Difficulties may be encountered where there are no puppies in the upper horn, in which case the lowest part of the non-gravid uterus is entered. It is not quite so easy as if it contained a fetus.

A puppy may be so placed that difficulty is experienced in bringing that part of the uterus out through the opening. Sometimes it is hard to extract a puppy, owing to its slippery state. Help may be had from an assistant by passing the flat of his hand under the belly, as he is able to press the contents up towards the opening. A very useful instrument is the human tongue forceps for grasping a leg, and it is here that the dry cheesecloth is handy.

The womb may exhibit quite a variety of conditions with respect to its contents, as dead puppies in different stages of development and preservation. Some may be in a state of rigor mortis or bloated with emphysema. You may find dropsical or hydrocephalic puppies. If a decomposed or bloated puppy, or a part of the uterus is necrosed, or if there is any odor of infection, prognosis is very unfavorable. It is astonishing how bitches can stand this operation when showing signs of being toxic and apparently unsatisfactory conditions prevail.

We never attempt to flush or irrigate with disinfectants. Any cleaning that is done is confined to mopping with dry sterile swabs. With respect to the presence of necrotic areas these may be excised or hysterectomy performed.

Occasionally a bitch will start to vomit towards the end of the operation, a very frequent happening with a cesarean. Operations should cease until the nausea is over care being taken to close

the opening to prevent abdominal viscera from being forced out, by using firm pressure over the operation opening with sterile cloths. The assistant administering the ether must attend to the bitch, freeing the mouth and throat from mucus and vomit, as there is a possibility of choking or collapse. In a few minutes normal respiration will commence again after the paroxysms of vomiting are over.

SUTURING THE UTERUS

When all the puppies, with their placenta, are removed, the uterus is closed and fine catgut of required size used, by means of a continuous suture, commencing at the lower end of the incision, including only the serous and muscle layers. After arriving at the end of the opening and closing it, the suturing should be continued back again to the starting point, making a double row of sewing, one on top of the other, where it is tied up. Care is taken to turn in the cut borders so that the serous coats are brought close together. With removal of any débris, the uterus is returned to its position in the abdominal cavity.

Peritoneum and muscles are sutured together with chromic catgut by the interrupted method, the stitches being about one-quarter to one-half of an inch apart. The skin is united by wax-linen thread, with interrupted sutures one-half inch apart.

Hemorrhage may cause death one to three days after the operation. Removing the afterbirths too hurriedly may be the means of causing this.

The bitch is then placed in a warm cage until the effects of the anesthetic wear off, which may take from a few minutes to several hours. Some have been known to care for and commence nursing puppies intelligently within an hour after entering the hospital.

I am a firm believer in having the bitch in her own home within a few hours after the operation. She settles down much better than if left in the hospital among strange surroundings. We frequently send bitches one hundred miles shortly after the operation.

The day following, a visit is made to remove the bottom stitch for drainage. Instructions are given to see that this is kept open and cleaned several times a day; and to report immediately any change in the disposition of the bitch. If unfavorable symptoms are noticed, such as loss of appetite, the temperature over 103° F., or no interest shown in the young, we advise taking the

puppies off the bitch and placing them on a foster mother, a cat, or resorting to artificial feeding.

We encourage breeders to advise us whenever they have a foster mother available for nursing, of which a register is kept and in some cases a fee is charged. Definite arrangements should always be made beforehand between the owner and the owner of the foster mother in regards to payment for rearing puppies. The fee varies from two dollars to five dollars for rearing a puppy, or it may be advisable to buy the foster mother or hire her for the time being.

Caution has to be used when introducing strange puppies to a foster mother. If she has some of her own they should be mixed together and watched for a while, as the strangers may not be welcome at first. As a general rule, if a female has plenty of milk, she will be only too glad to nurse puppies. A careful examination should be made of the foster bitch, to be sure that she is in good health, particularly with regard to the skin.

Treatment for the bitch is: attention to the wound without tampering with it too much, administration of tonics and forced feeding. In many cases the temperature drops to normal in a few days and the bitch soon gains sufficient progress to nurse her own puppies, providing satisfactory strength is not being made with their nursing by the foster mother or artificial feeding.

DISCUSSION

DR. J. C. FLYNN: The paper that Dr. Campbell just read to you contains ideas born of experience. You can always tell when a man knows his subject, because he talks from his finger tips. Dr. Campbell has had twenty years of experience in handling difficult cases of parturition. I have had the pleasure and opportunity of reading this paper very carefully before it was presented to this meeting, and I want to say that I am somewhat discouraged in my efforts to pick out something to criticise. There are a few minor points on which I may possibly differ from Dr. Campbell a little, but, in the main, his paper has covered the subject very completely, and, I think, very satisfactorily.

Dr. Campbell mentions the fact that fecal impaction and a distended bladder interfere with parturition, but he failed to tell us what he did in such cases. We would assume that he would possibly catheterize the matron, although it would be difficult to catheterize the urethra, to relieve the pressure, as any attempt to do so might injure the bladder or rupture it. So much for that point.

Dr. Campbell speaks about making a genital examination, but he did not tell you when to make it. That is one of the last things I do in difficult parturition. I examine the matron by palpating the abdominal walls, to ascertain whether or not there is life there, and try to empty the bladder and bowels. I make my examination of the abdominal walls to ascertain if there is life, whether or not there is labor, and if there is, I would hesitate to make the genital examination, because I believe that any genital examination, in a measure, is injurious to the matron, and I know when you contemplate the necessity of a cesarean operation the less genital examination made the better.

I was glad to hear Dr. Campbell modify his paper and his remarks in regard to the cesarean operation. I will agree with him that it is not a serious

operation, if you can get the matron, and make your diagnosis for this operation in time. But how many times is it that a valuable matron is brought to you in a condition that you know is dangerous, too dangerous to perform the cesarean operation. Yet it is the only thing you can do to give her the last chance, and many times the last chance is the lost chance. Many times it is death to the matron. That has been my experience. I perform that operation when I feel it is almost certain that we are going to lose the matron, and it is the only chance to save her, and where there is life, there is always a chance of saving the animal. I fail to treat the cesarean operation as lightly as does Dr. Campbell but I hope he has been fully successful. I know I have not.

Now, there is another point Dr. Campbell possibly overlooked. It may be that he has never used this other method, and that is, in starting to perform the cesarean operation, when you have opened the abdomen, it is many times possible to remove the fetus without opening the uterus, and when that can be done, I do it. In many cases you can grasp the uterus and push the fetus through without opening the uterus. I believe that is good surgery.

In his paper, Dr. Campbell speaks of clipping the hair from around the genitals and tail. That, from sanitary reasons, is advisable, and it is a good thing to do, but in many cases the owner will not permit it. In those cases I like to use antiseptic gauze and like to bandage the tail. You can do it successfully. You can get away with the hair of the tail by bandaging the entire tail.

Now, another little point that the author brings out in his paper is the separation of the instrument, placing it on the head of the puppy and then putting the instrument together. That sounds awfully good on the platform here, but my experience has been that it is a difficult problem, particularly with the instrument that Dr. Campbell held up before you. If you will hold that instrument up now, and put it together you will find that it is going to spread very wide the part that is in the uterus.

DR. CAMPBELL: I beg to differ with Dr. Flynn. The spreading of the forceps takes place in front of the pelvis, where there is plenty of room, particularly at the upper part of the genital passage. The jaws of the instrument are opened and lowered into their position, on either side of the puppy's head.

DR. FLYNN: In cases when there is lots of room, there would not be any difficulty in parturition.

DR. CAMPBELL: Of course it is difficult to use forceps intact if a puppy is jammed in the pelvic canal. In such situations, I try to push the puppy back into the body of the uterus, and if there is not room to open the jaws, I apply the instrument in two pieces, which I find quite simple. I might point out that in most cases of dystokia, the trouble is lack of room in the vagina. The uterus though is usually roomy enough.

DR. FLYNN: Now then, on one more point I will differ a little with Dr. Campbell. He does not advocate the use of the instrument unless he can feel the pup with his finger. I find that in practice it is necessary to go much higher. You can readily pick up the pup, way up in the uterus, and take it out without the necessity of a cesarean operation, and I believe if it can be done it is better than performing the operation. I have resorted to the method of bringing the uterus out until I could see the horns, and this much more so in the cat than in the dog, because it is more easily done in the cat, and safer than the cesarean operation.

DR. CAMPBELL: I quite agree with Dr. Flynn that puppies may be secured by forceps when out of reach of the point of the finger. When one knows one's instruments, one should be able to tell by the feel whether they have grasped the uterus or fetus, but it is nevertheless a good thing to be guided by the finger.

Just a word or two in answer to some of Dr. Flynn's very practical questions. When fecal impaction or distended bladder exists in connection with dystokia, the bowel should be emptied by an enema and the bladder by palpation or massage, and if a fetus is pressing on the floor of the vagina and interfering with micturition, it should be moved.

I see no reason why there should be ill effects from using the fingers in dystokia, if they are long and lean, and kept continually lubricated with a

mild antiseptic ointment. Many belated parturition cases can be brought on by stirring up with the finger, and quite often puppies may be delivered by the fingers. The use of finger grips or a piece of cloth will aid materially in securing a firmer hold on the slimy leg.

DR. FLYNN: I would like to ask Dr. Campbell a question to clear up one little point, and that is: Do you use just the ordinary catgut in stitching up the uterus?

DR. CAMPBELL: Yes. I consider plain catgut is sufficient. The uterus contracts so rapidly that the wound would almost heal without suturing.

DR. FLYNN: I like to use 10-day catgut because I have found that occasionally in abdominal surgery the plain catgut will loosen and slip, and it is a little bit dangerous.

Now, then, one more point, and that is the method and the point of making an incision through both the abdominal wall and the wall of the uterus. Dr. Campbell's method—and I believe it is the method of most surgeons—is to make a clean incision and then cut each of the lower abdominal walls separately. I like to, when I get through the skin, down to the abdominal wall, to the muscle tissues, I mean, insert my finger and separate them by tearing. It leaves a rather rough edge, but you have the advantage of sometimes pushing away fairly good-sized blood-vessels and save some of the nerves that you would destroy by cutting through the tissues.

Now, in regard to the point of incision in the uterus. We always make the incision on the dorsal surface. If there is any leaking, it is less likely to leak through from the dorsal surface than from the ventral surface.

Now in regard to another point—differential diagnosis in pregnancy. We have bitches brought to us occasionally and it is very difficult to diagnose pregnancy in them by the ordinary methods we have at our disposal. We may get a bitch that will come in with an abdomen distended, with milk in the breasts and the vulva enlarged, and most every symptom of pregnancy, and it is sometimes difficult to do that, especially on large fat patients. If I am in doubt on a point of that kind, I like to ask for a little time to make a diagnosis, and I take that animal and keep her for from 24 to 48 hours and I see that the bladder is empty and make my examination, and I can be reasonably accurate on it.

There are other conditions we might speak of, such as septic metritis. It is more likely to confuse the practitioner than any other, in my estimation.

DR. CAMPBELL: With respect to examining a female as to whether there are any puppies present, one should be very thorough, and most guarded in making any statement. Bitches of the breeds larger than the Boston are sometimes quite difficult to examine. I generally tell the owner that I am unable to feel any, but suggest that there is a possibility there may still be one or two left in, and advise him to watch her closely and report immediately if there is any indication of straining or unusual behavior. I might tell him that we could have an X-ray taken, but that this was not always satisfactory.

UTICA SCORES WELL

The city of Utica, N. Y., received a health score of 820.5 out of a possible perfect total of 1000 points in the city scoring recently carried on throughout the State by Dr. Huntington Williams, of Albany, District State Health Officer. In his report, Dr. Williams gave particularly high credit to Utica for "a generous health budget, for the excellent public health laboratories which are available, for the splendid city milk and meat inspection service under Dr. W. G. Hollingworth and for your good tuberculosis, venereal disease and child hygiene service."

SOME CAUSES OF STERILITY IN CATTLE*

By LEONARD W. GOSS, *Columbus, Ohio*

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Causes of sterility in cattle are very numerous. Some of them are easily explained, while others leave considerable doubt in the minds of clinicians and pathologists as to the exact causes. The fact that there is an inter-hormonic relation between the uterus and the ovary and some of the ductless glands, brings about considerable confusion in regard to the seat of the trouble. At times the ovaries show abnormalities which are difficult to explain with regard to the ovary itself. Also the uterus may show little, if any, abnormality which is recognizable. These conditions will be brought forth with some of the illustrations, with little attempt at the present time to state the exact causes. It is the hope of the author that these illustrations will bring forth some constructive discussion.

The persistence of the corpora lutea in the ovaries has received considerable attention by the clinicians in the past. With an attempt to clear up some problems, we will consider the life of the corpus luteum. It is formed after the rupture of the ovarian follicle. This rupture of the follicle takes place about forty-eight hours after estrum, as shown by McNutt.¹ Lutein cells develop within the place occupied by the ovarian follicle. In case of pregnancy, the corpus luteum persists until after parturition, at which time, providing the animal is a normal animal, it undergoes absorption. In the event that the animal is not impregnated, the corpus luteum is greatly reduced in size in about twenty-one days. Small vestiges of a pale color persist for a while. However, the disappearance of the corpus luteum in both events is preceded by fatty degeneration of the luteal cells.

During the two periods, or rather the latter part of each period, the fatty content of the lutein cells increases very rapidly, as shown by Elder² and by Bleecker.³ This change of the luteal cells into fatty material makes it possible for the rapid absorption. The color of the corpus luteum is not an indication of the amount of fat, as shown by Bleecker.³

In sexually mature, healthy heifers there is nearly always one well-developed corpus luteum and one or more vestiges which

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are usually quite free of pigment. This condition may not be found in the ovaries of old animals of questionable reproducing

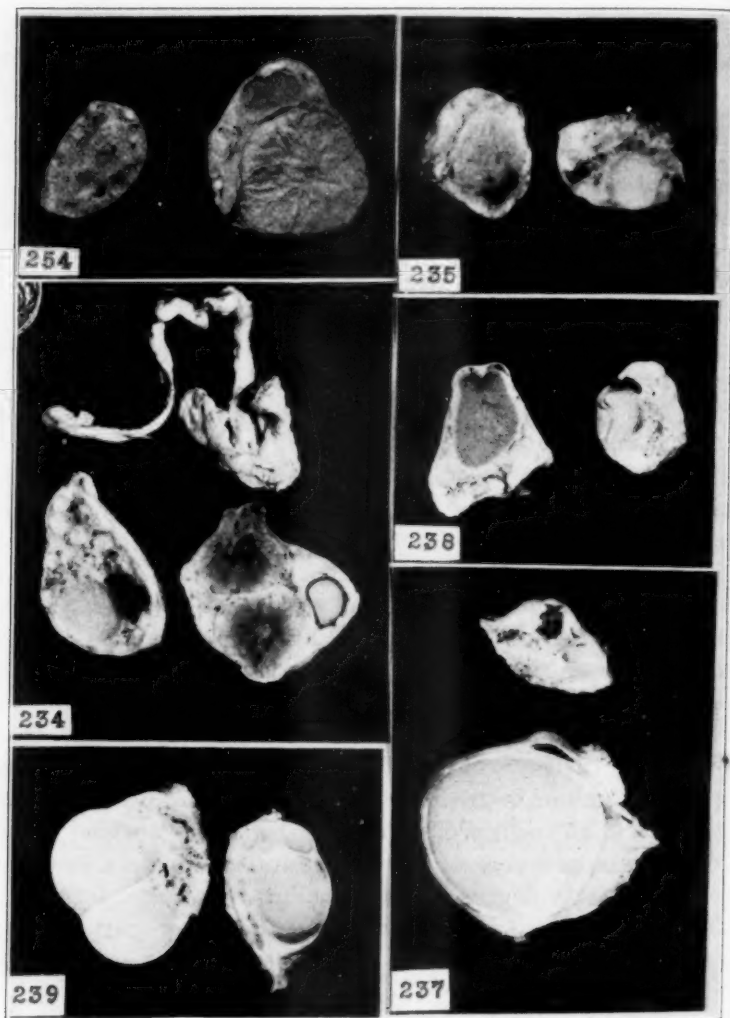


PLATE I.

Specimens 254, 235, 234, 238, 239 and 237.

qualities. Such ovaries may contain several brick-red vestiges of corpora lutea.

No. 254 These are the ovaries from an animal pregnant about 8 weeks; one ovary contains a corpus luteum 24 mm. in diameter, one follicle 7 x 15 mm. The other ovary contains follicles 4 mm. and smaller.

- No. 235 These are the ovaries from a cow with a poor breeding record. There is a corpus luteum in one ovary of the normal size and color. The other ovary contains a follicle 8 mm. in diameter and two vestiges of corpora lutea, brick red in color and irregular in shape, about 3 x 5 mm.

This animal was bred Nov. 29, 1924, Feb. 10, 1925, and March 12, 1925. She was then thought to be with calf. If so, she probably aborted in pasture. Bred, Oct. 10, 1925. In heat, Dec. 10, 1925. Killed, Dec. 24, 1925.

- No. 234 These are the ovaries of an aborting cow. There are two corpora lutea, in one ovary, of the same size, 22 mm. each. Also a cyst, 9 mm. in diameter, which is within brick-red tissue of the vestigial type of corpus luteum. The other ovary contains a follicle, 15 mm. in diameter, and a brick-red corpus luteal vestige, 12 x 7 mm. One of the fallopian tubes was thickened and contained a cyst at one place.

This cow aborted, Aug. 13, 1923, and was thought to have aborted in pasture in June, 1925. Aborted, Nov. 11, 1925. Not in estrum since. Killed, Dec. 24, 1925. It is not known whether she aborted one or two calves.

- No. 238 These are the ovaries of a cow which was sterile. One ovary contains a corpus luteum, somewhat smaller than the average, 14 x 21 mm. The other one contains a follicle and a brick-red vestige, 3 x 6 mm.

This cow aborted, July 26, 1925. Had been bred many times from Nov., 1924, to Nov. 1, 1925. In estrum, Dec. 5, 1925. Killed, Dec. 24, 1925.

- No. 239 These ovaries came from a cow which had a very poor breeding record, as will be seen by the history at hand. She gave birth to a calf, March 30, 1923. Between April 10, 1924, and March 13, 1925, she was bred seven times. She was in pasture during the summer of 1925, with no record of a living or a dead calf.

One ovary contains two cysts, one 27 mm. and the other 20 mm. in diameter. The other ovary contains a cyst with corpora lutea tissue surrounding it, which suggests cystic degeneration of the corpus luteum. This ovary also contains some ovarian follicles.

- No. 237 This pair of ovaries show a large cyst, 38 mm. in diameter, in one ovary and a small crescent-shaped, brick-red vestige of a corpus luteum, 7 x 2 mm. The other ovary contains a vestige, 7 mm., and one smaller. The animal was not pregnant. These ovaries suggest sterility.

- No. 246 This shows the ovaries of an animal which was not pregnant. One ovary contains a vestige of a corpus luteum, 7 mm. in diameter, and two smaller. Also a follicle, 5 mm. in diameter. The other ovary contains a vestige and several follicles, 5 mm. and smaller. The condition of the ovaries is suggestive of sterility.

- No. 253 Pregnant about nine months. Contrast these ovaries with the preceding. One ovary contains a corpus luteum, 26 mm. in diameter. The other ovary contains nine ovarian follicles, about 2 x 4 mm. in diameter.

- No. 252 Of this pair of ovaries, one contains a corpus luteum, bright yellow in color, 24 mm., which contains a cyst, 14 mm. in diameter. Two vestiges, 2 mm. each, of a brick-red color also are present in the same ovary. The other ovary contains a few small follicles, 2 x 4 mm. in diameter.

- No. 251 One ovary contains a corpus luteum, containing a cyst 22 mm. in diameter. The other ovary contains either a follicle or a cyst in the center, 9 mm., and a vestige of a corpus luteum, 3 mm., of a brick-red color.

- No. 250 One ovary contains a corpus luteum, 18 mm., with a cyst 9 mm. in diameter. The cyst was eccentric, having only a thin membrane over the free surface of the corpus luteum. The other ovary contained one follicle or cyst, 20 mm. in diameter.



PLATE II.

Specimens 246, 253, 252, 251, 250, 249 and 241.

- No. 249 One ovary contains a corpus luteum, 21 mm., the greater portion of which projects from the body of the ovary. It contains a cyst, 17 mm. in diameter. There is also a follicle, 14 mm., present in the same ovary. The other ovary contains only small follicles.

The foregoing cystic ovaries have contained cysts which have their development as cystic degeneration of the corpora lutea. They are far more common than the other type of cyst. They seem to respond to treatment more readily as they are probably a process associated with persistence of the respective corpus luteum.

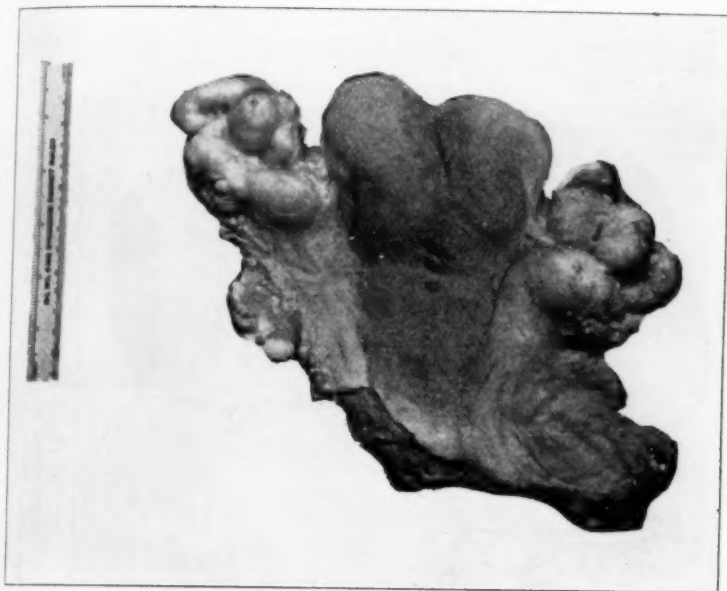


PLATE III.
Specimens 207 (left) and 227 (right).

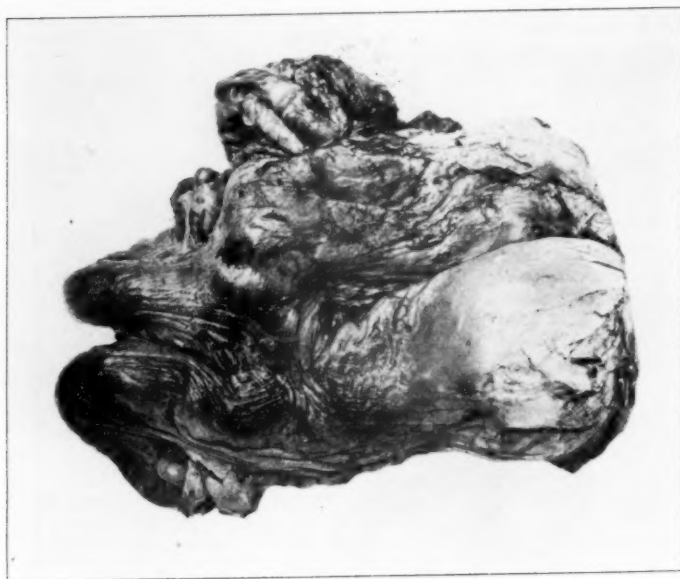


PLATE IV.
Specimens 76 (left) and 55 (right).

No. 241 A pair of ovaries which suggest cystic ovarian follicles. One ovary shows the presence of 4 cysts, 20-22 mm. in diameter. They comprise the greater portion of the ovary. The other ovary contains one cyst, 20 mm., and another cyst or follicle, 6 mm. in diameter.

The preceding case (241) shows the presence of cysts which have had their development within the ovarian follicles. This type of cysts is of less frequent occurrence than the preceding, but far more persistent, as it stands in that class of processes with cystic tumors. Consequently, all follicles in such ovaries are prone to undergo cystic degeneration instead of giving off an ovum at regular periods.

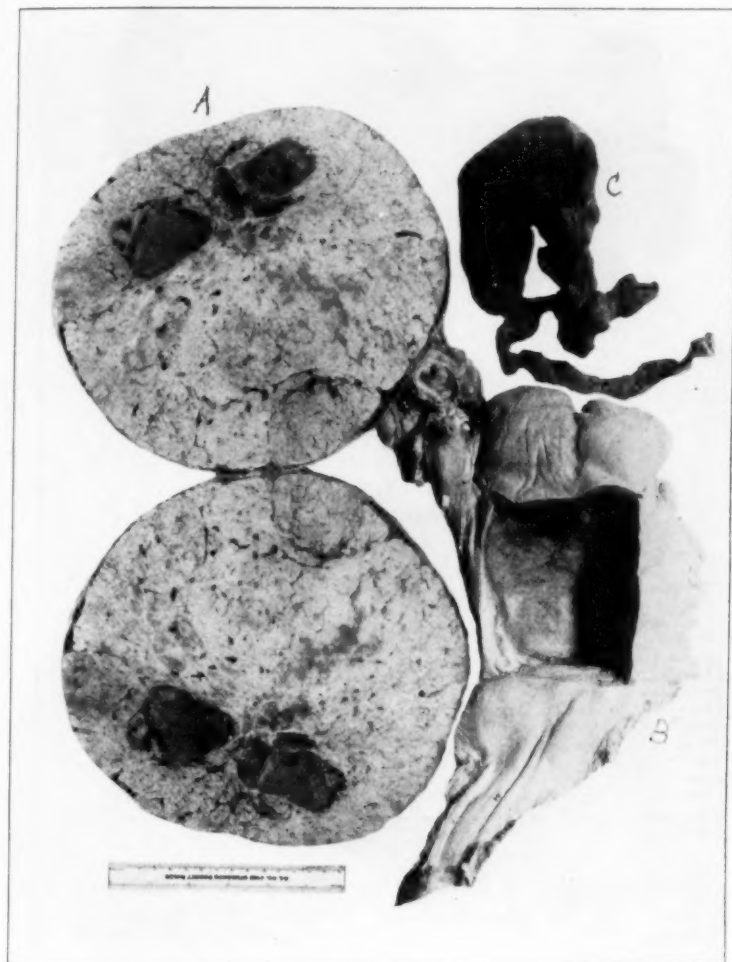


PLATE V.
Specimen 134.

No. 207 This shows a cystic fallopian tube, 65 mm. in diameter, which prevents the passage of the ovum to the uterus.



PLATE VI.
Specimens 212 (left) and 28 (right).

- No. 227 Tuberculosis of the fallopian tubes which are increased to about 25 mm. in diameter. One ovary contains a cyst, about 21 mm.; the other contains a cyst, 25 mm. in diameter.



PLATE VII.
Specimen 124.

- No. 76 Shows the uterus from a cow which had been sterile for a long period. It shows extensive adhesions involving the ovary and fallopian tubes. Probably the results of metritis and perimetritis.

One case of abdominal pregnancy has been encountered. The dead calf, almost mature, was contained within a membrane. It had hair upon it, which was embedded in the membrane surrounding it. This was an umbilicus, about 15 cm. long, the vessels of which became lost within the surrounding membrane.

The uterus was apparently normal. One ovary contained a corpus luteum. This was found in a slaughter-house and no history was obtainable.



PLATE VIII.
Specimen 136.

- No. 55 Shows a uterus containing the bones of a dead fetus.
- No. 134 Shows a tumor (A) of the ovary, which was about 30 cm. in diameter. The tissue which composed the bulk of the tumor was of the character of the corpus luteum. The uterus (B) contained a mummified fetus (C).
- No. 23 This is a fibroid tumor in one of the horns of the uterus.
- No. 124 This shows the uterus and the vagina of a two-year-old Shorthorn heifer, which came into estrum regularly, but never became impregnated.

Exploration revealed the presence of a large mass in the anterior portion of the vagina.

The animal was slaughtered, at which time it was found that the embryological development of the vagina was incomplete, which left a transverse membrane near its middle. The uterine fluids had accumulated within the vagina forming a cavity six inches in diameter. The uterus contained no fluid and appeared to be in a normal condition.

Lillie's⁴ work shows the sterile free-martin is the result of hormones from the male twin circulating through the blood-vessels of the female twin. This is made possible by the anastomosis of the chorionic vessels, which nearly always occurs in the uterus of the cow when twins are present. Lillie reports one case in which there was no anastomosis and that the female was anatomically normal. His observations indicate that about 87 per cent of the free-martins are sterile and 13 per cent fertile.

- No. 212 Shows the organs of a free-martin, in which the ovaries have changed toward testes, in that they contain tubules instead of graafian follicles. There is only a slight development of the wolffian duct and the müllerian duct is well degenerated.
- No. 133 Shows a gland upon one side which contains tubules simulating the structure of testes. The other one is much smaller. The müllerian ducts have enlarged to form tubes about 10 mm. in diameter, but they are only 4-6 cm. long, becoming atrophic before their junction. There is no body to the uterus. The vagina is typical of the free-martin.

The free-martin shows great variation in the extent of the development of the internal genital organs. This is probably due to the hormonal influence of the male twin which may be controlled by the extent and time of the anastomosis or to other unknown factors. The external sex characters are dependent upon the interior anatomical variation toward the male organs.

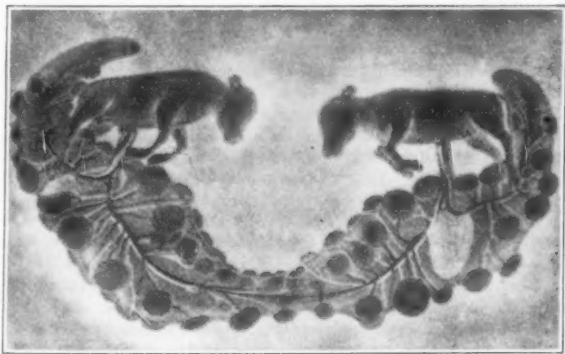


PLATE IX.

Twin calves with fetal membranes, showing the anastomoses of the umbilical vessels. (After Lillie, *Jour. Exp. Zool.*, xxiii (1927), No. 2.)

The persistence of numerous highly colored corpora lutea is suggestive of hormonal influences which are probably located outside of the ovary. In some instances the condition is associated with an unmistakable metritis; at other times, there may be only a catarrhal condition which is not recognized. It is quite probable that there are other contributory factors.

The cystic degeneration of the corpus luteum may be a process of degeneration resulting from long existence of the body, or other factors may be responsible.

The cystic ovarian follicle can probably be classed with the cystic tumor, which usually results in permanent sterility.

Cysts of both fallopian tubes result in sterility through interference with fertilization of the ovum.

The free-martin has a questionable breeding value, as only 13 per cent are fertile. These may be determined at an early age by vaginal examination, as those which are sterile have only the ectodermal invaginated position of a vagina.

REFERENCES

- ¹McNutt, G. W.: The corpus luteum of the ox ovary in relation to the oestrous cycle. *Vet. Pract. Bul., Div. Vet. Med., Iowa State College*, viii (1926), 1, pp. 79-122.
²Elder, C.: Studies of the corpus luteum. *Jour. A. V. M. A.*, lxxvii (1925), n. s. 20 (3), pp. 349-363.
³Bleecker, W. L.: The relationship between the color and the fat content of bovine corpora lutea. *Jour. A. V. M. A.* (To be published.)
⁴Lillie, F. R.: The free-martin; a study of the action of sex hormones in the foetal life of cattle. *Jour. Exp. Zool.*, xxiii (1917), 2.

DISCUSSION

DR. E. T. HALLMAN: I want to express my appreciation to Dr. Goss for the work that he has just illustrated. At least some of his illustrations demonstrate a problem in pathology about which I know nothing. I refer particularly to ovarian disease. It is a simple matter to demonstrate diseases of the ovary clinically. I refer to cystic corpora lutea or cystic follicles, but I am sure I know nothing about the causes underlying the occurrence of these pathological processes in the ovary.

In Dr. Goss' opening remarks, he referred to the numerous causes of sterility. In order to appreciate the complexity of the causes of sterility, I think it is only necessary for us to appreciate the complexity of the function of reproduction. Reproduction might be defined as a result of the correlated function of a group of organs, including some of the endocrine glands of both sexes. Failure in development of any one of these organs, absence of function or altered function of any one, may prevent conception. We know very little about the function of reproduction. While a little is known, the physiology of reproduction is yet to be worked out. Until we do have a clearer understanding of the physiology of reproduction, we shall not be able to understand altered function of reproduction, which is the basis of sterility.

It is known that the function of at least some of the reproductive organs is cyclic in nature. I refer to the progressive and retrogressive changes in the corpus luteum, the progressive and retrogressive changes of the endometrium, and the progressive and retrogressive changes of the follicle and the placenta. Reproduction apparently depends upon the orderly correlation of these cyclic changes in the various organs. To just what extent the cyclic activity of the various organs is influenced by disturbances in other organs, I do not know. Further, just what influence the disturbance in the cyclic activity of an organ, for instance, the ovary, has on the development of pathological processes in that organ, I do not know. It is entirely possible

that the pathological processes illustrated—persistent corpora lutea and cystic ovaries—may be due to pathological influences in other parts of the reproductive tracts; for instance, due to infection of the cervix and the endometrium. For a long time we have felt that perhaps an important cause of disturbances in the ovary is localized disturbances in the cervix and in the endometrium.

I have made some observations, during the last year, which have tended to stimulate this line of thought which I have just referred to, in connection with some work that I have been doing on the pathology of abortion disease in guinea pigs. It has been my privilege, during the last twelve months, to examine over 2000 slides prepared from the organs of something over 100 guinea pigs, experimentally inoculated with various strains of the abortion bacillus, from both human and animal sources, and one observation that I have made is particularly suggestive, namely, the apparent influence that minute microscopic lesions in the epididymis may have on the condition of the testicle. It is not proper that I should refer here to the pathology of the Bang abortion bacillus more than simply to illustrate what I hope to say. As I have observed the fundamental process of infection in the experiment animals, it is one that partakes of the nature of a focal infection. There is a comparatively mild reaction at the site of the establishment of the organism. There is at first no destruction of tissue, but there is a proliferation of tissue and a determination of cells which, in their essential characteristics, resemble the minute tubercle due to the tubercle bacillus. Time and again we have observed these early areas of focal reaction in the epididymis, microscopic in size, in which there has been no destruction of tissue and in which cases there has been a complete absence of spermatogenesis in the tubular epithelium of the testicle. Time and again I have observed that condition where the examination of many slides from the testicle demonstrated no evidence of localization of infection in the testicle, but the localization of infection apparently limited to the epididymis, and yet for some reason spermatogenesis had ceased and in many cases with very marked degenerative changes in the tubular epithelium.

Further, in some of these same cases we have observed a process which we have interpreted as hyperplasia of the so-called interstitial cell of the testicle. I do not mean by that the interstitial connective tissue, but those large polyhedral cells which many believe are of importance in elaborating the hormone of the male which influences the male sex characteristics.

I am not in a position to interpret or to explain the cause and effect, but I am simply bringing it out here to indicate that it is not illogical to assume that much of the ovarian trouble in cattle is due to disturbances or local infection in the endometrium and in the cervix. Just what they are, I cannot explain. It has at least had one effect on me. In the limited amount of clinical work that I do—as you all know, I am not a clinician, but I do keep my hands in the pie just enough to keep familiar with it—as I think more over the complexity of this problem, I become more and more conservative in my attempts to treat ovarian disease.

One thing of particular importance that Dr. Goss illustrated is the fact that at almost any time during the period of sex activity of the cow, it is possible by clinical examination to demonstrate corpora lutea and one or more developing follicles in one or both ovaries. Of course, we have no difficulty in recognizing the cysts clinically after they have assumed a size which is in excess of the maximum size reached by the mature follicle, but I do know that in clinical work, as practiced by many veterinarians, a great deal of crushing of cysts is done when there are no clinical indications for it. If a cow has a history of sterility, it is a simple matter for the veterinarian to find one or many of these small cyst-like structures in the ovaries. You cannot distinguish, clinically, between a developing follicle and a small cyst, and we know that cysts may be microscopic in size. We all know that corpora lutea are dislodged in cases of clinical sterility, where there are no clinical indications for it. As I have previously said, I have become very conservative in my manipulation of the ovaries. I try to account for lesions in them on the basis of alterations in other parts of the reproductive tract, looking upon them as secondary to some other important factor rather than primary, and in that way I attempt to

direct my efforts towards the primary causes, if possible to recognize them. In other words, I think a great deal of our efforts in the treatment of ovarian trouble has been directed at the result of a condition and not the cause of it.

I am sure that my discussion has not thrown any light on the correction of this problem. I did not hope that it would. It is still a problem of physiological and pathological research. But I do hope that what I have said may stimulate a little more conservation on the part of clinicians in the treatment of the diseases of the reproductive organs and stimulate an effort to acquire all of the knowledge that it is possible to acquire. When you have done that, you will not have acquired a great deal when compared with the vast amount of ignorance that we still have with reference to the physiology of reproduction.

DR. J. F. DE VINE: I do not know that I got what Dr. Goss meant just right. If I did not, others may not. He stated, as I understood him, that Dr. Lillie has found that there is an anastomosis between the circulations in all cases. If he did state that, then he explained later that the influence of the hormones on the female, in the case of male and female, would depend largely upon the amount and time of anastomosis. If that be true, Dr. Goss, what explanation would we have for any of the thirteen per cent being fertile? Perhaps you explained it, but I did not get it.

You also said that the practitioner who treated some of this herd at an earlier period wondered if he had not done some injury by manipulation. If he used the crowbars and picks and shovels that we used twenty years ago, he certainly did, and if he injected irritants in the uterus he certainly did.

Dr. Hallman has just sounded a very sane keynote. Do not maul your animals so that you make a possible breeder an impossible one. I agree with Dr. Hallman that I can not see any excuse in the world why any man, manipulating or handling or examining the female organs and finding them, so far as he can determine, apparently normal, with the possible exception of these little blebs or follicles on the edge, likes to express the corpus luteum. He had been told to do it, and that is the only excuse in the world why he does it, perhaps. But I hope he will stop now, from the good advice that Dr. Hallman has given. Do as little as possible, but make sure that you know what you are doing and, as Dr. Hallman states, perhaps you have just a little catarrhal condition of the cervix that douching will take care of.

This work of clinically handling sterility cases or animals that are giving breeding trouble has been overdone. Get back to sane, careful manipulation and then make sure that you know something about it. One of the most capable practitioners in the East, in this audience, confided to me last night that he did not know whether he had hold of a cyst or a corpus luteum. If he does not know, there are a lot of others of us who do not know. It is unfortunate that Dr. Goss could not have had some actual specimens here. His plates were wonderful to a man who has given the matter any attention, but if we could have had some ovaries and tubes here to show a man what a normal corpus luteum is, or a cystic, degenerative corpus luteum, then he would be able to go out with certainty of knowing one from the other.

I congratulate both the speakers. They are doing the very thing that I think every one should do at this time who is attempting to dispense knowledge on sterility—learn something about the normal organs and then be awfully careful what you do afterwards.

DR. GOSS: Lillie found, in a few cases, that there was no anastomosis of the vessels, and in those cases the female was normal.

DR. DE VINE: Perhaps that accounts for the thirteen per cent.

DR. GOSS: In all of those that were normal females, with a twin male, he has found no anastomosis of the vessels.

Minneapolis, the Financial, Wholesaling, Jobbing, Retailing, Manufacturing, Distributing, Educational, Cultural Metropolis of the Northwest

THE ILLINOIS OUTBREAK OF DOURINE

By W. L. WILLIAMS, *Ithaca, N. Y.*

The outbreak of dourine in Illinois, officially recognized by the State, in 1887, is of historic interest to the veterinary profession in several ways. It was the first recorded outbreak of the disease in an English-speaking country, so far as I can find. It was probably the focus from which the infection was derived in the later outbreaks in the Northwest.

The official reports of the outbreak appear in the Annual Report of the State Board of Live Stock Commissioners of Illinois, chiefly for the years 1887 and 1888, with minor additions as late as 1894. Like most reports of that class, they have already disappeared and after the lapse of forty years are not readily available to most members of the profession. It therefore appears desirable that the history of the outbreak be briefly retold at this time because, amongst other considerations, references are now and then made to the occurrence in such a manner as apparently to endanger the historical accuracy of the event.

At the time of the outbreak I was performing the dual function of private practitioner at Bloomington, McLean County, Illinois, and Assistant State Veterinarian. By referring to my report of the outbreak in the Annual Report of the Illinois State Board of Live Stock Commissioners for the year ending October 31, 1887, page 62, it will be found that I was called to the adjoining county of DeWitt in April, 1896, in my capacity of a private practitioner, to examine some stallions and mares affected with a disease which I recognized as dourine, then better known as *maladie du coit*. Fortunately Liautard recognized the professional and historical value of the report sufficiently that he copied it entire in the *American Veterinary Review*, Vol. 12, page 295. The existence of the disease was promptly reported by me in 1886, but the Live Stock Commissioners and the State Veterinarian, John Casewell, M. R. C. V. S., were at that time very busy with, and extremely anxious concerning, the great outbreak of contagious pleuro-pneumonia of cattle in Chicago. They had never heard of such a disease as dourine, and so far as any visible reaction to my report was concerned, they apparently did not hear of it then.

The disease gradually spread and early in 1887 the breeders of the region involved became decidedly alarmed. I then reported the matter to the Commissioners for a second time, advising them that conditions were growing decidedly serious and that, unless the malady were promptly and rigorously dealt with, it promised serious loss to the horse-breeding industry.

Finally the Commissioners authorized me to quarantine any diseased animals but still failed to realize the importance of the situation, to such an extent that I was advised to write out such quarantine notices as I might need instead of the State furnishing printed forms. When I at last convinced the Commissioners that hundreds of animals were involved, and that the disease was very malignant, they met me in the involved region and at once realized the serious state of affairs. I was granted authority to deal with the disease and had placed upon me an abundance of responsibility.

A SERIOUS SITUATION

The community was naturally and justly greatly alarmed. There was no one to whom I could turn for counsel who had had experience with dourine. In veterinary literature the two very distinct venereal diseases of horses were hopelessly mixed. I had discovered and reported the disease, and to me had been assigned the task of control. While it was perfectly clear that I was dealing with dourine, veterinary authorities were in hopeless confusion regarding the symptoms and diagnosis. The breeders were much alarmed and were being swayed in various directions, somewhat according to their supposed interests. While technically they knew nothing about the disease, practically they knew quite well that it was killing their horses and that the contagion was spreading. There was no great degree of confidence in veterinarians in general and, quite naturally, none too much confidence in the veterinarian in official charge.

As nearly as the facts could be learned, the disease had been smouldering since the spring of 1883, or three years before I had been consulted. So far as the tangled skein could be unraveled, it appeared that the infection had been introduced from France. It was at that time believed that the offending animal was a Percheron stallion designated in my report as No. XV. This was not proven, but was merely what appeared the most likely source. Looking backward, that conclusion is open to some question. No. XV was alleged to have been imported in 1882,

when two years old. If the allegations as to age and date of importation were true, it is improbable that he had copulated in France, in which case it is virtually certain that he was not infected when imported. But some queer things occurred in those days regarding the ages of imported horses and the represented age did not always correspond with the state of dentition. A small three-year-old was more salable if represented as a large two-year-old.

The French government filed a vigorous protest with that of the United States, against the conclusion that the dourine infection came from France, alleging that the disease was unknown in France at the time. Be that as it may, the disease had been quite certainly introduced from Europe, and there were no imported horses in the involved area, so far as I could learn, except those which were represented as having come from France. By common consent, but so far as I know, in no case accurately traced, all other outbreaks of dourine in North America have been assumed to have originated from the initial outbreak in Illinois.

DISEASE UNDER CONTROL IN 1887

Having begun to spread insidiously in 1883 and 1884, the infection had acquired somewhat extensive and intricate dissemination when finally placed under official control in 1887. In the interval, an undetermined number of animals which had been exposed had been sold and had gone to unknown destinations. A few common work mares which had been exposed were traced into adjacent counties and placed in quarantine before they had been bred in their new locations. One stallion, designated as No. XVIII in the 1887 report and said to have been diseased, was traced to California and the authorities notified of his presence. This was the only supposedly diseased stallion known to have left the infected area and the only animal of either sex which was traced to destinations outside of Illinois.

The dangers to other states, counties or localities did not depend upon the diseased or exposed animals which were traced to their destinations but to the undefinable group of animals which had been sold or traded to unknown or unrevealed parties and had disappeared without a trace. It was this group which was apparently responsible for the several outbreaks in the northwestern states and Canada.

It is essential to have a clear conception of the character of dourine, and of the environment of the outbreak, in order to understand how it was possible that the malady did not spread more destructively. Dourine is the most exclusively venereal infection known. Aside from artificial inoculation, its transmission except by coitus is unknown. The environment of the outbreak greatly favored its confinement to a small area. It was restricted, so far as active spread in Illinois was concerned, to an area of 30 to 35 square miles in De Witt County, between Wapella on the north and Clinton on the south. Two or three common work mares which had been exposed or became diseased had been removed to neighboring counties but had not been bred there. The area was not an important exporter of breeding horses. Geldings and some mares were sold to go to distant lumbering-camps and to the eastern cities for work purposes, and none of such mares were likely to be bred. The dangerous sales were of common work mares to go to the northwestern states for the dual purpose of farm work and breeding. These I believe the source of the outbreaks in that region.

DISEASE NOT WIDELY DISSEMINATED

The highly concentrated breeding district about Bloomington, Illinois, extended to within less than ten miles of the infected area but there was virtually no traffic in horses between the two sections. Mares were not sent from the one section to the other to be bred. About one thousand draft stallions and mares were imported each year, mostly from France, to the Bloomington area, and sold to go elsewhere. The current was *from* the free, *toward* the infested area. The comparatively few horses sold from the area went out of the State, not into adjacent counties.

After the disease had been placed under official control in June, 1887, so far as I can determine, no infected animal was removed or escaped from the involved area. But one minor outbreak occurred within the infected area. Owing to violation of quarantine, one mare and one grade stallion became affected on one farm, and both animals were promptly destroyed.

I say, "so far as I can determine." In apparent conflict with this is the statement of Kudo¹:

In 1886, Dr. W. L. Williams, then of Bloomington, Ill., found an outbreak of a disease in horses, which was later found to be dourine, caused by infection with *Trypanosoma equiperdum*. The disease was traced to a Percheron stallion imported from France in 1882. It is most probable that the horse was affected by the trypanosome at the time of purchase.

Instead of being destroyed, the stallion was shipped to Gordon, Nebr., in 1888, and, in 1892, an outbreak of the disease occurred in northwestern Nebraska.

The stallion to which Kudo refers was a brown Percheron, commonly known at that time as "the Moore horse," owned by Joseph Fischer, of Clinton, Ill., and designated as No. XV in the 1887 report of the Illinois State Board of Live Stock Commissioners. The report shows, on page 82, that I placed that stallion in quarantine on July 19, 1887. The report shows further that of the 18 diseased or exposed stallions, all recognizably diseased stallions, except Nos. XIV and XV, had died, been castrated or destroyed. Both stallions belonged to Fischer. Fischer, a German, of quite positive notions, had no mares of his own, and refused to permit the destruction of his stallions without legal contest. His neighbors had seen enough of dourine that there was little danger of their violating the quarantine by breeding mares to the diseased stallions and it was virtually impossible for the stallions to be spirited away and used elsewhere for breeding, so the Commissioners quarantined the stallions and waited. As shown in the 1887 report, No. XVI died from castration, without expense to the State, leaving of the original Fischer stallions, only Nos. XIV and XV. The 1888 report indicates, on page 30, that one of these two stallions had died, presumably from drugs administered by Fischer, which he thought might cure the disease. Thus the second Fischer stallion had been satisfactorily disposed of without cost or trouble to the State. Finally, as shown on page 27 of the 1891 report, Fischer mellowed, and after having kept the third stallion in quarantine for about four years, accepted the compensation originally tendered and permitted the destruction of the last known diseased stallion.

ALL STALLIONS ACCOUNTED FOR

This accounts officially for the entire list of diseased stallions and indicates that all had been killed or had died and that none had been sold or had otherwise escaped from the infected area. A careful search of the official, and other available records of the outbreak fails to reveal any basis for the statement of Professor Kudo above cited.

One possible explanation for what I believe to be an error on Kudo's part, may be pieced together from other recorded statements. Faville,² in his report upon an outbreak of dourine at Gordon, Neb., relates that several stallions and mares were

involved. He describes some of them at considerable length. The history of the one animal which possibly led Kudo into error reads:

Case 1. Black stallion, 8 years old, the property of M. Swigert & Co., of Gordon, Nebr. Horse by Brilliant. This horse was sold by Mr. Dunham of Illinois, as a 2-year-old, to parties near Bloomington, Wis. (Not Bloomington, Illinois). He was brought from Bloomington to Gordon, Nebr., with four or five other stallions, intended for the Indian agency at Pine Ridge, S. Dak., by Mr. J. Newman, and was purchased by Swigert & Co., about Dec. 30, 1890.

A careful reading of this quotation with its context, associated with a fairly accurate knowledge of the environment of the Illinois outbreak, proves beyond question that the stallion, No. XV of the 1887 report and indicted by Kudo, was in no way connected with the Nebraska affair. It also shows beyond reasonable doubt that the colt sold by Dunham was not the bearer of the infection to Gordon, Nebraska.

1. Mr. Dunham, located over 100 miles from the Illinois outbreak, was one of the foremost importers and breeders of Percheron horses of that time, and his imported Brilliant was probably the most famous Percheron sire in America. The animal cited by Faville, was evidently bred by Dunham, at Wayne, Du Page County. Sold as a two-year-old, he had quite certainly never copulated with a mare and hence could not have had dourine. Besides, there is no ground for even a faint suspicion that there was a mare in Du Page county affected with dourine with which he might have copulated.

2. The animal described by Faville was black, not brown. No question of color could possibly arise. No. XV was definitely a brown, not on the border line between black and brown. My recollection of No. XV, after a lapse of forty years, is particularly vivid. If his ghost were to rise up and walk before me now I think I would immediately identify him and at once attempt to verify it by lifting his mane and looking for the brand beneath it.

3. The stallion described by Faville had been in service for five or six years at Bloomington, Wis. There is no record of the occurrence of dourine at that point or in that state, and hence no reason for suspecting that the stallion carried dourine to, or from, Bloomington, Wis.

4. Faville neither stated nor implied that the animal mentioned was a carrier of dourine.

But around Faville's plain statement of fact are interesting possibilities for inferences and assumptions. This possibly may explain the statement of Mohler,³ nine years later:

The State of Illinois, however, took hold of the outbreak (in De Witt Co.) and as a result of rigid prophylactic measures the disease was eradicated from the state in 1888, *but not before an affected stallion had been shipped to Gordon, Nebr., thereby starting up a new center of infection in that locality.*"

Mohler's language supplies the foundation for the suspicion that he had read into Faville's report, implications for which, so far as I can determine, there was no definite basis. Mohler fails to identify in any way the stallion alleged to have been shipped to Nebraska, and gives no date of shipment. If any diseased stallion was shipped from De Witt County, Illinois, to Gordon, Nebraska, either before or after the official recognition of the disease in 1887, the official reports fail to mention the fact, no such information reached me during my work with the outbreak, and I find no record of such an occurrence elsewhere.

As stated above, I believe that the outbreaks in Nebraska and elsewhere in that region emanated from De Witt County, Illinois, but so far as I can possibly determine, the carriers were the common work mares which had gone in unknown numbers to unknown destinations, prior to June, 1887. Perhaps Mohler only meant to express the opinion that the Nebraska outbreak of dourine emanated from that of Illinois; upon which point we are fully agreed.

It then requires only a bit of imagination so to modify the quoted statement of Mohler to give birth to that of Kudo and make it appear that the Illinois authorities permitted the diseased stallion, No. XV of the 1887 report, to go to a distant state and cause there a destructive outbreak of dourine.

SALIENT FACTS RECORDED ANEW

Accordingly, it appears to me important that the salient facts be placed anew before the profession at this time. If Dr. Mohler, Professor Kudo, or others, are in possession of important evidence indicating that serious errors crept into the official reports of the Illinois dourine outbreak, the facts should be definitely recorded by them; otherwise the official reports of the outbreak should be accepted as authentic history.

Aside from the desirability that official reports of the control of contagious diseases should be accepted as authentic, there is another important reason for establishing, if possible, the historical accuracy of the official reports of the Illinois outbreak of dourine. Beginning not far from the date of that outbreak, there arose a tendency, still conspicuous, to abandon, in part, clinical

observation in the diagnosis and control of contagious diseases, and to substitute therefor, instead of adding thereto, bacteriological, serological and other laboratory methods. The Illinois outbreak, occurring before the discovery of the trypanosome of dourine, could be controlled only upon the basis of clinical observation. If, as I claim should be done, the official reports are accepted as true, the disease was brought under control within less than two years. Except for one recrudescence, due to violation of quarantine, and involving but two animals, which were promptly and effectually disposed of, no recurrence of the disease has taken place during the forty years.

Furthermore, if it is granted that the official reports are authentic, no diseased animal escaped or was removed from the affected zone after the official recognition of the disease, in 1887. The control of the disease was prompt, complete and enduring, and stands as a distinct clinical achievement which suffers none by comparison with the efforts at the control of later outbreaks when the officials in charge had at their command the bacteriological, serological and other laboratory methods of diagnosis. No forward-looking clinician has the remotest desire to discard or minimize the value of bacteriological, and other laboratory methods of diagnosis, but there is a not wholly unnatural tendency for some veterinarians to be attracted unduly by the newer standards and to forget that clinical observation is still of very great value—just as valuable now as ever in the history of veterinary science.

REFERENCES

- ¹Kudo, R. R.: Pathogenic protozoa of domestic animals. *Jour. A. V. M. A.*, lxxi (1927), n. s. 24 (4), pp. 466-470.
²Faville, G. C.: Annual Report U. S. Dept. of Agr., 1891-92, p. 359.
³Mohler, J. R.: Dourine of horses. U. S. Dept. of Agr. Bul. 142 (1911).

ILLEGAL PRACTITIONER PROSECUTED

George R. Bowyer, recently of San Diego, Calif., was the first man arrested and charged with practicing veterinary medicine without a license, in California, under the new Veterinary Practice Act. Bowyer pleaded not guilty, was released on his own recognizance, but failed to appear for trial. The Judge issued a bench warrant for Bowyer's arrest and set the bail for \$1,000.00. It is believed that Bowyer has left California. He has a diploma from the old veterinary correspondence school formerly in business at London, Ontario. Such a diploma, of course, is not recognized by the California statute.

THE PLACE OF VETERINARY MEDICINE*

By H. A. MORGAN, Knoxville, Tenn.

President of the University of Tennessee

I am very glad to come to your association at this time to pay tribute to the profession you represent. The public has little information on the type of service you render the commonwealth and that which the profession contributes to our national wealth and the welfare of the human race.

As a profession you have been badly presented. To some extent, though, you are responsible. When veterinary service became a part of the educational program, the horse was over-emphasized and the profession was dominated by horse admirers. The wide range of college courses in comparative anatomy, physiology, pathology and medicine and the unusual opportunity of veterinary practice in live stock development in the agricultural program of the nation could not overcome the emphasis given by veterinarians to horse breeding and management, particularly of the saddle, driving and racing types. So intimately did the profession become associated with the horse that the larger field of veterinary service was unwittingly sacrificed. It was natural, then, that with the advent of the automobile the public and even the profession felt that the "horse doctor" business was about over. The psychology of this whole situation has temporarily brought discouragement and a lack of appreciation for an economic and health service which no other phase of our educational effort can supply. Good horsemanship was too long substituted for scientific training in the treatment and promotion of domestic animals in their relation to agricultural and public welfare. We have come to an important turning-point with respect to veterinary medical service. The time has arrived for intelligent presentation of the place of veterinary studies and practices in the protection and development of American live stock industry and its relation to a successful and permanent agriculture and to a prosperous and healthy people.

No profession has suffered quite so much from the lack of proper educational standards and appreciation of educational requirements. If dumb brutes could enter the courts of this country and the untrained and malpracticing individuals be ex-

*Summary of an address delivered before the annual meeting of the Tennessee Veterinary Medical Association, Jackson, January 5, 1928.

posed, the veterinary profession would today take rank with human medical practice from the standpoint of educational requirements, public appreciation and economic welfare.

Who have made more efficient contributions than our outstanding veterinarians? The standing of a Grenside, a Pearson, an Alexander, a Dalrymple, a Salmon and many others who might be mentioned is comparable to leaders in other professions and other walks of life. No group of citizens have made larger contributions to American live stock interests than our well-trained and conservative veterinarians. They have not only cured the sick, and prevented and controlled devastating contagious diseases, but they have promoted dairy, beef, swine, sheep and other live stock industries in a way utterly impossible without their intelligent and professional guidance. It is impossible to estimate the value veterinary practice and veterinary information have been to the live stock industry of the United States and Canada. There is no substitute for it. The present lull in interest in the profession is beginning to create anxiety among stockmen, farmers, health experts and those responsible for our vast regulatory and inspectional service, and the inquiry is already broadcast, what agency can take the place of the well-trained veterinarian or how shall the profession be established upon a more inviting basis?

FUNCTIONS OF VETERINARY ORGANIZATIONS

Your state and national associations are the avenues through which to establish surveys, accumulate information, begin intelligent propaganda, and prescribe remedial measures. Your interest in the profession is not mainly as a business in which to work out a livelihood. Your main interest is the profession's contribution to economic and social welfare and the success of our state and our nation. May I repeat that no other profession or educational group can take over the fundamental work of the medical doctors of domestic animals.

Those associated with our economic educational program have become greatly concerned about the losses accruing in the veterinary profession. An annual demand of 600 well-trained veterinary doctors with a supply of less than 150 threatens the future of our live stock and agricultural interest and creates serious concern in the health, regulatory and inspectional organizations of this country. For this reason you can command the interest and intelligence of the layman as never before. There is need now

of well-organized information as to the exact situation. The profession can rise only on a well-standardized program of education. The quack and charlatan have already done incalculable injury. Their methods and standards have been repudiated. The public will accept scholarship in domestic animal medical practice as in other callings. Fundamental educational preparation is as essential for the veterinarian as the human physician. The interests of agriculture, live stock and health are demanding the highest educational qualifications. The public is ready to respect, promote and employ trained veterinarians and concede them the professional recognition they merit. Doctors, dentists, pharmacists, lawyers, all have their educational and standardizing committees. The veterinarians must use the same means to create and promote those educational qualifications and standards commensurate with the dignity and economic interest which your calling represents. This calls for immediate action. The Land Grant colleges of the country are vitally interested and offer unusual opportunity for the permanent alignment of our live stock interests and the study and control of all domestic animal diseases. You can not stop malpractice of dumb animals by legislation alone. Public sentiment through proper educational effort is an essential too long neglected. There should be persistent effort to present to the public the contribution of our national wealth which veterinary practice has made and is making.

SANITARY SCIENCE INTRODUCED IN RURAL COMMUNITIES

Veterinarians were among the first to interpret science in relation to live stock production and hence to introduce sanitary science to our rural population. The importance of this service extends far beyond the immediate benefits of the economical live stock production and to agriculture. The health and food supply of all the people are involved. The service to the nation of hog cholera studies and control, of tick eradication, of life history studies of *Trichina*, of tapes, of stomach and other round worms, and the discovery of intermediary hosts in the control and even eradication of devastating disease is beyond our ability to evaluate. The public is in need of just such data in order that there may be a full realization of the tragedy that is just ahead if the veterinary profession is permitted any further decline and neglect.

Veterinarians were the pioneers in the study of external and internal parasites and laid the foundation for the zoologists'

interest in the whole field of parasitology. They are responsible for the entomologist's study of biting and sucking lice, fleas, flies, ticks, mites and the large number of insect intermediary hosts of animal and plant organisms. No one is more responsible for the advanced place of bacteriology and protozoology in our health and science programs today than the veterinarian.

Intercommunicable disease, cow's milk and other animal products as media for the development of infected soils as carriers of disease organisms have given much impetus to bacteriological studies and specialization.

The whole service of meat inspection and of sanitation is a contribution the veterinarian may well take pride in. Our live stock breeders have never adequately acknowledged this service. This contribution and its intimate relation to our live stock and agricultural welfare is alone sufficient justification for the alarm that now obtains because of the lapse of interest in the veterinary profession.

INTERPRETERS OF SCIENCE TO FARMERS

Veterinary practitioners, like agricultural teachers, have made invaluable contributions as interpreters of science to the farmers and live stock producers. They have taken the discoveries made in the broad field of zoology, bacteriology, and chemistry and developed a practical science of domestic animal medical practice which has found a distinct place in live stock production, sanitation and disease control. It is this field of service the public is anxious to promote and protect. The zoologist, bacteriologist and chemist, as research workers or technicians, are invaluable alike to human and domestic animal medical practice.

In closing, I desire to commit the educational program of the University to the service of rehabilitating veterinary medicine and live stock sanitary service. Our agricultural and live stock studies presuppose the guidance of well-prepared and well-trained physicians of domestic animals and the continued support of a scientifically manned regulatory and sanitary service. We are ready, as are all Land Grant institutions of the country, to join you in any well-organized plan of informing the public of the place of veterinary medicine in the complex of our advanced civilization and to encourage young men to enter this field of humane, economic and scientific endeavor.

I commend you for your unselfish service and for the fine contributions you and your profession have made to our state and national welfare.

THE LATEST DEVELOPMENTS IN THE STOCK-POISONING PLANTS SITUATION IN INDIANA*

By ALBERT A. HANSEN, *Lafayette, Indiana*

Purdue University Agricultural Experiment Station

Much of our experimental knowledge of toxic plants, particularly in their relation to live stock, is of comparatively recent origin, consequently few Indiana veterinarians have had an opportunity to secure training along this line during undergraduate days.

During the past five annual meetings of this association it has been my privilege and pleasure to present the fundamental facts and principles regarding the poisonous-plant situation in the Hoosier state. With this foundation as a basis, I desire today to bring before you the results of the most important developments along this line during the past year.

TREMETOL ISOLATED

Particularly noteworthy has been the discovery of the poisonous principle in white snakeroot, *Eupatorium urticaefolium* Reichard, perhaps the most important stock-poisoning species in Indiana. For several years attempts to isolate the toxic principle by the North Carolina Agricultural Experiment Station, the School of Pharmacy of Purdue University, and other investigators have met with failure. During the past year the poisonous principle has been isolated and purified by Dr. James N. Couch,¹ of the United States Department of Agriculture, who discovered the toxin to be a complex alcohol called *tremetol* (so called because it is the cause of trembles in animals), with which are associated two minor poisons, a resin acid, believed to be responsible for cases of winter snakeroot poisoning, and a volatile oil which is toxic to guinea pigs but probably of little consequence as far as farm animals are concerned.

With the discovery of tremetol, a simple method of detecting its presence in milk has been developed, which should be useful to Indiana veterinarians in suspected cases of the poisoning of suckling offspring and to the medical profession where human milk sickness is involved. The method can also be applied to detect the toxin in butter and in the plants themselves. Inci-

*Presented at the annual meeting of the Indiana Veterinary Medical Association, Indianapolis, January 18, 1928.

dentially, the application of the test to plants growing in different regions has demonstrated the important and illuminating fact that white snakeroot may vary considerably in toxicity; specimens gathered around Washington, D. C., for instance, showing little tremetol content, while plants growing in the vicinity of Lafayette, Indiana, yielded a large amount of tremetol and were extremely toxic. This may explain why, in some sections where white snakeroot is plentiful, practically no stock losses have been experienced.

In performing the test, pour a few cubic centimeters of the suspected milk into a tube and extract the tremetol with petroleum ether, ether, pure gasoline or any other good solvent. If gasoline is used, it should first be tested by pouring slowly on 2 cc of sulphuric acid in a test-tube to make certain that it does not contain impurities that react red with the acid.

Agitate the milk and solvent gently until thoroughly mixed, then allow to stand for a half-hour when the solvent forms a separate upper layer. Do not shake the tube violently or a troublesome emulsion will result. Into another and dry tube pour about 2 cc of concentrated sulphuric acid, then gently decant a few cubic centimeters of the solvent along the inner wall of the tube until a layer about one inch deep floats on the sulphuric acid. Do not allow the milk to enter, or carbonization will result. If tremetol is present a reddish color will form at the junction of the two layers, although if there is but a trace of the trematol only a faint orange tinge may be discernable. When the tube is shaken the solvent layer assumes a transient reddish tinge while the acid is colored a characteristic cherry red, particularly if the tremetol content is fairly high.

Samples of the fresh plant or of suspected milk or butter may be sent to the Division of Botany, Purdue University Agricultural Experiment Station, Lafayette, Indiana, to be tested. Trematol, however, is apt to disappear as the plant tissues dry.

SWEET CLOVER HAY POISONING

Another recent and important development has been the widespread appearance of sweet clover poisoning in Indiana. Due to numerous red clover failures and the high price of red clover seed, sweet clover has forged to the front as a major crop in Indiana. With it has appeared a new disease of cattle and sheep that is characterized principally by the loss of clotting power of the blood. This is probably of little importance on pasture, although there

is evidence that operations such as castration or dehorning should not be performed while animals are pasturing on sweet clover. It is safer to remove them for a period of three weeks to avoid all danger of death through bleeding. Dr. J. C. Vance, of Indianapolis, has had considerable experience that indicates that heavy pasturing of rank-growing, woody sweet clover may also prove dangerous not only on account of the possibility of impaction but also because of the danger of internal bleeding. This, however, is a matter that needs investigation.

The greatest danger of sweet clover poisoning is in the improper feeding of the hay. A typical case of this character occurred on the farm of Charles Ort, of Woodburn, Indiana, where seven out of a herd of eleven cows died during February of last year, following the liberal feeding of sweet clover hay. The first indication of trouble was the discovery of blood in the troughs, due to nose-bleed in several of the animals. The next symptom noted was a peculiar, stiffened gait and the development of swellings under the skim. These tumors, which appeared on all parts of the body, varied from the size of a pea to that of a football and were at first soft and spongy to the touch, some later becoming hard and solid. No loss of appetite was noted and there was no indication of fever.

During the following two weeks the animals died and the post-mortem revealed that death was due to internal bleeding, the swellings noted being the result of the accumulation of blood under the skin. Hemorrhages were found throughout the body except in the abdominal organs and the blood was of a peculiar color almost exactly like that of rich port wine.

SHEEP DEVELOP DISEASE

On the same farm two flocks of sheep were being fed, the western feeders on a grain ration and the Indiana ewes on a diet that included large quantities of sweet clover hay. The animals fed on sweet clover hay developed symptoms practically identical with those observed in the diseased cattle and eight died before the cause of the trouble was ascertained.

Serious outbreaks of sweet clover hay poisoning have been reported in Canada, North Dakota, Minnesota, Illinois, New Mexico, and elsewhere. Investigators have advanced the theory that the trouble is due to moldy hay since the bottoms of most sweet clover hay stacks are practically always moldy and the trouble usually appears when the bottom hay is fed. It must

not be forgotten, however, that by the time the bottom of the stack has been reached considerable of the hay has been fed and there is evidence that the disease is the result of quantity feeding rather than the effect of molds. In a test conducted by the Veterinary Department of Purdue University it was noted that the feeding of clean sweet clover hay to a horse affected the blood until it lost its clotting power.

Two suggestions have been made for the prevention of sweet clover hay poisoning. The first is to alternate the feeding of the hay every two weeks—that is, do not feed it for a greater period than two weeks at a time. The second suggestion is to prevent the trouble by not allowing more than 25 per cent of the ration to be sweet clover hay. When fed in small quantities there seems to be no danger of the development of sweet clover hay poisoning.

Schalk reports that, in North Dakota, nursing calves have been affected through the dams' milk. In this respect it resembles white snakeroot poisoning in Indiana. The toxic principle in sweet clover has not as yet been discovered although some experimental work along this line is being performed.

Indiana veterinarians should not discourage the use of sweet clover, which is a valuable crop, but they should discourage the improper feeding of the hay. As a matter of fact, sweet clover is primarily a soil improvement and pasture plant under Hoosier conditions rather than a hay crop, although many Indiana farmers utilized it for hay during the past season.

REFERENCE

¹Couch, J. F.: Directions for making pathological tests of materials suspected of causing milk sickness. Jour. A. V. M. A., lxxi (1927), n. s. 24 (6), pp. 774-775.

Minneapolis, City of Lakes and Gardens

SEASONAL VARIATIONS IN VITAMIN CONTENT

That watercress, the familiar garnish for meat and salad, is a remarkably rich source of the vitamin necessary for growth and of the scurvy-preventing vitamin C, has been found by Dr. Katherine H. Coward and P. Eggleton, of the University of London. It boasts of small quantities of vitamin D, as well, in its small green leaves. The green shows considerable seasonal variation, however, in its growth-promoting properties, being more effective with laboratory animals in this respect in spring and summer than in winter.

—*Science.*

MINERALS IN SWINE FEEDING*

By H. H. MITCHELL, *Urbana, Illinois*

Professor of Animal Nutrition, University of Illinois

The mineral requirements of swine can be met by the proper selection of feeds, but under certain conditions it may not be expedient to supply all of the minerals needed in this way. The feeding of mineral supplements will be profitable when swine rations are composed too largely of grains and grain products, particularly in the case of growing pigs and of pregnant and lactating sows.

Corn and probably all grains and most of the vegetable feeds are deficient in one or both of the elements found in common salt, *i. e.*, sodium and chlorin. Swine should therefore have access to salt, either as a component of a mineral mixture or of ground feed. The use of iodized salt for this purpose may be recommended as an insurance against iodine insufficiency and thyroid hypofunctioning. This part of the country is in a semi-goitrous region, so that the added expense of iodized over common salt may be justified. However, in using iodized salt, the danger of losing iodine from it, due to careless methods of storage, should be appreciated. Unnecessary exposure to air, heat or light should be avoided.

Aside from common salt, the most general deficiency of grain rations is a deficiency in calcium. Calcium may be supplied in such feeds as tankage, skim milk and legume pastures, or in mineral supplements such as limestone, marl, whiting, wood ashes, rock phosphates and bone preparations. These supplements contain calcium in either the carbonate or the phosphate form. Since phosphorus is rarely if ever deficient in whole grain rations, it is largely immaterial which salt of calcium is fed. When fed in considerable amounts, phosphates are better tolerated than carbonates.

Limestone, marl and whiting contain calcium in the carbonate form. They are very variable in their content of calcium, due to contaminations with clay or other debris, or, in the case of limestone, with magnesium carbonate. The dolomitic limestones may contain as much as 50 per cent of magnesium carbonate. It was thought until recently that any considerable contamination

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with magnesium carbonate rendered a limestone unsuitable as a mineral feed, on the theory that the magnesium seriously impaired the utilization of calcium. It has been shown at the University of Wisconsin, however, that this is not true, and that dolomitic limestones are as good as non-dolomitic limestones per pound of calcium contained in them.

Wood ashes are extremely variable in composition, and may contain from 20 per cent or less to over 65 per cent of lime or calcium oxid. While their value as a source of calcium in swine feeding has not been definitely determined, there appears to be no reason to doubt their usefulness in this respect.

ROCK PHOSPHATE AS A SOURCE OF CALCIUM

Rock phosphate as a source of calcium in animal feeding has given variable results, generally unfavorable. The differences in the results obtained are probably due to differences in the kinds of rock phosphate on the market, and the generally unfavorable character of the results of rock phosphate feeding is probably traceable to the fluorin almost universally present in mineral calcium phosphate deposits. There are rock phosphates on the market which are very finely ground for direct application to the soil. These preparations contain about 2 per cent of fluorin. There are other rock phosphates that are unwashed and relatively coarsely ground, which contain close to 3 per cent of fluorin, while apatite, the purest calcium phosphate mineral, contains 3.8 per cent of fluorin, in its most usual form. Experimental work has definitely shown that fluorin may interfere with calcium utilization in the animal body, and may even cause calcium withdrawals from the skeleton. Hence, the poor results obtained generally with rock phosphate as a mineral supplement to animal rations are not surprising. It is, however, quite possible that the washed phosphate rock is a good and an economical calcium supplement.

Bone preparations, such as green bone, bone ash, spent bone black, and particularly steamed bone meal, have given excellent results in animal feeding and are undoubtedly among the best sources of calcium. The only objection that can be made to them is their relatively high cost, as compared with calcium-containing mineral fertilizers.

The addition of salt, iodine, and a good calcium supplement to grain rations for swine should be a sufficient safeguard against mineral deficiencies of general occurrence, according to available

information. However, other mineral deficiencies may in the future be shown to occur in swine rations. The possibility of an iron deficiency in grain rations has been investigated experimentally. Definite indications that iron compounds might be of benefit in animal feeding were published by the Rowett Institute of Animal Nutrition, at Aberdeen, Scotland, in 1924. According to these experiments, suckling pigs may develop a condition which is mainly characterized by anemia, and certain circulatory and respiratory disturbances, when the sow is being fed a ration containing no iron-rich supplement, and is being confined with her litter indoors. In an experiment with one sow and her litter, the feeding of iron oxid to the sow appeared to avert this trouble in the pigs. The Purdue Agricultural Experiment Station has reported recently the experimental production of anemia in suckling pigs, apparently similar in all respects to that obtained at Aberdeen. However, neither iron salts nor iron-rich tankage exerted any distinctly favorable curative or protective effects. The condition appeared to be related to the conditions of indoor confinement rather than to the ration fed.

IRON-FEEDING EXPERIMENTS

At the Ohio Experiment Station they have performed a number of experiments on growing pigs after weaning in which either ferric oxid or ferrous sulfate was added to various rations, some of which contained tankage. In four of six trials with ferrous sulfate (copperas) better average growth was obtained with the iron-fed pigs than with their controls. In two experiments with ferric oxid contradictory results were secured. Iron-feeding experiments at the Iowa Experiment Station have not been, with one exception, sufficiently well controlled to indicate whether the copperas included in some of the experimental mineral mixtures has or has not produced a favorable effect. In one experiment with Venetian Red, containing over 60 per cent of ferric oxid, more rapid and economical average gains were obtained than with no iron addition, although the basal ration contained tankage.

During the last year, the Swine and Nutrition Divisions at the University of Illinois conducted a somewhat extensive investigation on the value of copperas as a supplement to (1) a ration relatively high in iron because of its content of tankage and (2) a ration poor in iron consisting entirely of vegetable feeds. Our results were entirely negative with the low-iron ration, while with

the high-iron ration the results indicated an actual retarding effect of the copperas on the growth of the pigs.

Taking into consideration all of the experiments on iron feeding, there appear to be no grounds for believing that the addition of iron salts to grain rations is either necessary or beneficial. It is, perhaps, natural to think of iron-deficiency in considering the etiology of anemia, but the current trend of recent work favors the view that other factors may be more potent in causing this condition. Furthermore, where iron salts have been found to be effective, ferric oxid and ferrous sulfate have given poor results as compared with other salts of this metal.

COPPERAS OF DOUBTFUL ANTHELMINTIC VALUE

It may not be out of place to consider briefly other substances than those of proven nutritive value that are frequently included in mineral mixtures. Copperas is often put into such mixtures to retard or to prevent the growth of intestinal parasites. However, insofar as I have been able to discover, the value of copperas as an anthelmintic has never been experimentally demonstrated. The U. S. Department of Agriculture and the Ohio Experiment Station have tested the anthelmintic value of copperas with negative findings, and in the Illinois experiments above referred to, a continuous daily dose of 1 gram of copperas made no perceptible difference in the worm infestation of the pigs. In one experiment on copperas feeding, by Withers and Caruth, a daily dose of 9 grams of copperas for 127 days did not prevent a heavy infestation of intestinal parasites in pigs. Before leaving the subject of worm remedies, the question may well be raised whether it is advisable to include any drugs of this character in the daily ration of pigs, particularly in mineral mixtures that are frequently self-fed.

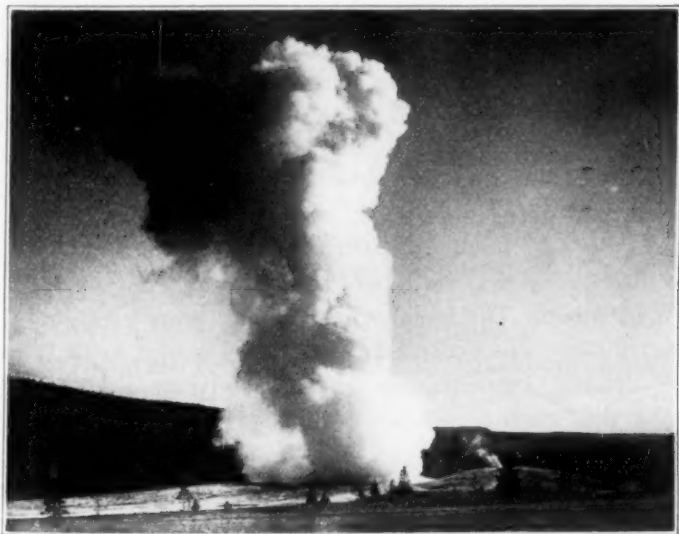
The use of such inert substances as charcoal and sulfur in mineral mixtures seems difficult to justify. The supposed value of charcoal in alleviating certain digestive disorders cannot be properly urged in support of its general use for animals not so afflicted. The function of sulfur in the daily feed of an animal is also difficult to appreciate. In experiments with growing laboratory animals, small additions of sulfur to the ration have produced toxic symptoms, evidently due to the hydrogen sulfid produced from sulfur by the intestinal bacteria. The self-feeding of mineral mixtures containing any considerable amount of sulfur may thus easily prove harmful.

Mild laxative salts, such as Epsom or Glauber's salts, are frequently included in mineral mixtures for no good reason at all. Grain rations contain 2 per cent or more of crude fiber, which ordinarily should be sufficient to insure proper regulation of bowel movements. Occasional cases of constipation or of sluggish bowel movements should be treated as they occur, by changes in the ration or by some effective method of purging. It is extremely improbable that the amounts of purgative salts that would be consumed in a mineral mixture would be at all effective unless they constitute such a large fraction of the mixture that its value for any other purpose would be seriously impaired.

The agricultural experiment stations in this country have in the main subscribed to the proposition that a mineral mixture is justified only insofar as it supplements the nutritive value of the ration with which it is fed. The addition to it of drugs or tonics possessing no proven nutritional value seems irrational and may prove to be harmful. In any case it adds to the cost of the mixture without assuring any added returns from it.

***Minneapolis, the Gateway to the
Ten Thousand Lakes Region***

ON THE WAY TO MINNEAPOLIS



Nature's time-piece—Old Faithful Geyser, Yellowstone National Park.

MORTALITY IN CHICKENS FOLLOWING THE FEEDING OF MASSIVE DOSES OF VIRULENT FOWL TYPHOID BACTERIA*

By W. V. LAMBERT and C. W. KNOX

Iowa State College, Ames, Iowa

In connection with a study to determine the part that inherited factors may play in resistance to fowl typhoid, the authors have had occasion to observe on a rather large scale the mortality due to this disease following the feeding of massive doses. Since very little information is on record concerning mortality due to this disease, it is hoped that the following observations may be of value.

Kaupp and Dearstyne¹ have reported most extensively on the mortality of this disease under field conditions. From a study of 56 flocks in which the disease occurred, they report the mortality ranging from 1 to 100 per cent previous to vaccination. The average mortality was 26 per cent.

After vaccination the loss in these same flocks varied from 0 to 27 per cent, with an average flock loss of 3.8 per cent. The total loss, both before and after vaccination, amounted to 28.9 per cent. D'Herelle² states that the annual mortality in France amounts to from 40 to 70 per cent of the population of the infected poultry-yards. Van Es and Martin³ state that affected birds rarely recover.

The studies reported herein were made over a period of three years and all the birds used were single comb White Leghorns, for the most part, ranging in weight from two to three pounds. The results of the three years' tests are shown in table I.

All of these birds were given a massive dose of fowl typhoid bacteria per os. Each bird, with the exception of the females in the 1926 group, was fed 6 cc of a 20-hour infusion broth culture of the organism. The females used in 1926 were given only 3 cc of the culture. The birds were fed by means of a catheter and a small funnel. The catheter was inserted into the crop, thus insuring that each bird received an equal amount of the same culture.

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Of the 220 birds inoculated during the three years, 105, or 47.7 per cent, died. Considerable variability in total mortality was shown in the different years, this ranging from 55.1 per cent, in 1924, to 41.8 per cent, in 1925. In 1925 and 1926, the number of females that died was much less than the number of males. In 1924, however, the situation was reversed, although in this case the number of males is hardly sufficient to be indicative. No reason for the greater mortality of the females in 1925 can be given, for in the opinion of the writers both males and females appeared equally vigorous at the time of the infection. In 1926, as noted previously, the females received only half as much of the culture of the organism as did the males and this possibly may account for the difference observed in this case.

TABLE I—*The mortality in a population of White Leghorn fowls when infected per os with a massive dose of fowl typhoid bacteria*

YEAR	TOTAL IN- FECTED	SEX	MORTALITY AT VARIOUS INTER- VALS FOLLOWING INFECTION												TOTAL DEAD	% DYING
			1- 5	6- 10	11- 15	16- 20	21- 25	26- 30	31- 35	36- 40	41- 45	46- 50				
1924	9	Males		1	2								3	33.3	49	55.1
	40	Females	1	2	8	2	7	2	1			1	24	60.0		
1925	19	Males		1	4	1	4						10	52.6	43	41.8
	24	Females		1	5	1				1			8	33.3		
1926	60	Males		12	11	7	1	5					36	60.0	128	46.9
	68	Females		11	5	4	1			3			24	35.3		
Totals	220		1	28	35	15	13	7	1	4		1	105	47.7		

Just what relation there may be to the degree of exposure is not certain, but in this case the number of organisms fed was extremely large, many times larger, undoubtedly, than a bird ever receives in a field infection.

In table I, the mortality rate has been listed in 5-day intervals. It will be noted that the heaviest mortality occurred between the sixth and fifteenth days, 63 of the 105 birds having died during this interval. In the interval from the 15th to the 25th day, the mortality was still quite heavy, after which it rapidly diminished. One bird died on the fifth day after infection and one on the 47th. The latter was a chronic case which upon autopsy showed mild lesions of typhoid. An attempt to secure a culture from

the liver proved unsuccessful. The bird that died on the fifth day after infection showed unmistakable lesions of typhoid.

Of the total number of birds that died in 1924, five had chicken pox as a complication and one showed pneumonia on autopsy. Of the birds that recovered, four were affected with chicken pox during the course of the disease. In 1925 no complications were reported, but in 1926 five of the birds that died showed some bronchitis and one had chicken pox. Colds were observed, also, among a number of the birds that recovered.

The birds were graded by the authors, according to their general appearance, into three classes, and the mortality for these three classes was determined. Of the total number of birds tested, the condition of 206 was listed as good, 12 as fair and 2 as poor. Out of the 105 birds that died, 96 were listed as in good condition, 7 as fair and 2 as poor. It would seem from these observations, that within reasonable limits, the condition of the bird may influence its reaction to the disease.

There were 115 survivors out of the 220 birds infected and 105 that died. Practically every bird infected showed a susceptibility to the disease as measured by temperature and general condition, although there were a few that showed no clinical symptoms. There was much variability in the degree of reaction as shown by the clinical observations in both the birds that died and those that recovered.

These results would seem to contradict the statement of Van Es and Martin that affected birds seldom recover. Many of the birds that recovered have been used in the breeding flock. Their production and hatchability have been as good as those of similarly bred birds that were not subjected to the disease.

While the mortality reported herein is greater than the average reported by Kaupp and Deerstyne, it is not so high as the death-rate noted in some flocks by them. One of the most important factors probably influencing the mortality observed in flock infections is the virulence of the infecting organism. In the studies reported here, this has been controlled as completely as possible. Before being used on the birds in the experiment, the infecting organism was fed to several chickens and only after it had proved its virulence by killing at least 75 per cent of the birds infected was it used.

Another reason for the great variability reported in natural outbreaks of this disease may lie in the individual inherited differences in resistance existing within different flocks. Roberts

and Card⁴ have reported upon differences in resistance to bacillary white diarrhea in chicks from various flocks, Pritchett⁵ has found slight differences in the degree of resistance to mouse typhoid in several inbred strains of mice, and Wright and Lewis⁶ have observed rather marked differences in resistance to tuberculosis among inbred strains of guinea pigs.

The exact role of inborn factors for resistance or susceptibility to the different diseases is as yet unknown, for practically all studies to date have considered only the variability in the infecting organism, and have more or less neglected the variability due to the inherent differences in resistance of the different hosts. Due to the complexity of resistance, however, any studies attempting to assign a role to inborn resistance must be carefully controlled from the standpoint of degree of infection, virulence of the infecting organism, condition of the infected animals, and general environment.

ACKNOWLEDGMENT

The writers wish to express their appreciation to Drs. Chas. Murray and S. H. McNutt, of the Veterinary Investigation Department, for isolating the organisms used in these trials, for performing all autopsies and for many valuable suggestions.

REFERENCES

- ¹Kaupp & Dearstyne: N. C. Agr. Exp. Sta. Tech. Bul. 27 (1925).
- ²D'Herelle: The Bacteriophage (Williams & Wilkins, Baltimore, 1922).
- ³Van Es & Martin: Nebr. Agr. Exp. Sta. Bul. 195 (1923).
- ⁴Roberts & Card: Poultry Sci., vi (1926), pp. 18-23.
- ⁵Pritchett: Jour. Exp. Med., xli (1925), pp. 195-209.
- ⁶Wright & Lewis: Amer. Nat., lv (1921), pp. 20-55.



Tennessee veterinarians in annual session at Jackson, January 5, 1928.

VULVOVAGINITIS IN SWINE

Preliminary Report

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During the early summer of 1927, reports of a condition described as affecting the external genitalia of swine began reaching us from certain parts of the state. The condition became more prevalent as summer advanced and began to subside in numbers of new cases in the late fall and early winter. A few isolated cases have occurred throughout the winter. The disease is reported principally from Illinois, Minnesota and parts of Iowa. It has also been observed in Indiana and South Dakota and no doubt was present in other parts of the country. In Iowa, the disease is reported only from the northeastern part of the State. The southern boundary of the affected area, starting from Clinton, proceeded west to about twenty miles west of Cedar Rapids and then northwest to Estherville, Iowa. This line, together with the north boundary of Iowa, includes a wedge-shaped portion of the State and in all of this territory vulvovaginitis was commonly observed. However, it was most commonly reported and was most severe in the counties of Dubuque, Linn and Chickasaw. Only one case was reported as far west as Estherville.

The term "vulvovaginitis" covers the main pathological changes observed in affected animals and for that reason is used here. Vaginitis alone cannot be used because the condition primarily is an inflammation of the vulva, seeming to affect the vagina only secondarily and then only the posterior portion. Vulvovaginitis does not cover prolapse of the rectum, which appears to be also a secondary lesion, nor does it include inflammation of the prepuce. Reference in the literature to vaginitis or vulvitis of sows, particularly infectious vaginitis, is lacking. In reviewing the literature it is surprising to note that hogs are especially free from specific and non-specific diseases of the genital tract, but particularly free from inflammatory conditions of the vagina. It appears that there never has been an infectious vaginitis recognized as such in sows. Not only

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is this true but sows are particularly resistant to infections and other factors that might produce vaginitis.

The hog then, apparently, is the only common domesticated animal that has not been subject to this condition in an infectious form. Animals affected have been mostly young gilts, although there are often a number of boar pigs or barrows that show some inflammation of the prepuce, but since the male pigs are apt to be affected with a sporadic, mild, non-specific inflammation of the prepuce, the evidence is not strong enough to state certainly that such is analogous to vulvovaginitis in the female. However, inflammation of the prepuce is very common in affected herds. Prolapse of the rectum has not been noted in males and is an indication that the anus and rectum are not affected, except secondarily, and then only in a mechanical way, where prolapse of the vagina already exists. Young suckling female pigs also are affected, although not seriously. Gilts from six weeks up to 100 or 150 pounds in weight are most often affected. Sows over a year old sometimes show or seem to show a slight enlargement of the vulva. Such changes due to the heat period might be confused with the condition in mature animals. No other species of animals on farms where the disease occurs show any vaginitis or vulvovaginitis. It would appear that the condition is specific for pigs.

If we exclude a mild inflammation of the prepuce in the male as a possible lesion of the disease, the lesions are confined to the vulva, posterior part of the vagina and to the rectum and anus. The first change to be noted is a gradual enlargement or swelling of the vulva. It seemingly differs in no way from enlargement of the vulva due to the heat period, but the swelling continues until the vulva is smooth, very firm, tense and elevated or swollen out from the body. Then it is that the lips separate and the vaginal mucosa, only slightly injected or reddened, begins to show. The inner portions of the vulva and vaginal mucosa continue to swell until the mucosa protrudes through the lips of the vulva. The weight of the prolapsed portion drags the more anterior portions out. Return circulation is partly checked, resulting in passive congestion and distention of the prolapsed organs. Up to this time congestion or hyperemia has not been marked and only occurs due to constriction of the blood-vessels by the swollen vulva.

The prolapse may extend out a distance of six inches and have a diameter of four inches. Due to its exposed position and the

resulting irritation, pigs are inclined to rub, causing injury. The parts become bloody, eroded, purulent and highly injected. In these respects the prolapse does not differ from prolapse from other causes. Death may result from hemorrhage, septic infection, urinary poisoning or infection of the bladder, ureters or kidneys. The anus shows no evident inflammation until the rectum begins to prolapse. Prolapse of the rectum in this disease does not differ from prolapse from any other cause, and occurs only after severe swelling of the vulva or prolapse of the vagina and is evidently produced by straining, rubbing, and mechanically by pressure from the swollen parts below the rectum. Prolapse of the rectum occurs in about 5 to 10 per cent of the cases, while prolapse of the vagina occurs in a larger percentage, in some herds as high as 30 per cent.

There are no marked general symptoms and no pain except in cases of bad prolapse. There is little or no discharge or exudate from the anterior portion of the vagina. Until affected by some secondary condition the pigs seem thrifty, are active and eat well. Autopsy of animals killed in the height of the disease shows the ovaries, tubes, uterus, cervix, kidneys, ureters and bladder to be normal. The urethra is inflamed only when it has been dragged back by prolapse of the vagina. In fact, all organs except those visible from the exterior are grossly normal. The anterior portion of the vagina is nearly free of inflammation, with only a few cells and flakes of exudate and without any marked evidence of purulent material. In making cultures from the vagina of infected pigs considerable mucus was noted. Swelling and tenseness of the affected parts is due mostly to edematous fluid and cellular infiltration.

Autopsy of gilts that have died of the disease shows that death has been due to secondary conditions such as septic cystitis, uremic poisoning or constipation and septicemia following necrosis of the exposed prolapsed parts. Death has not resulted except in cases of prolapse and then only from secondary causes as noted above. There may also appear a slight enlargement of the mammary glands in some affected gilts. Stimulation of sexual desire has not been noted except in experiment pigs that were of such an age they might have come in heat had they not been on experiment.

After study of several cases three possible causes of the condition appeared to merit our consideration and were therefore investigated. They were:

- (1) Bacterial infection.
- (2) Plant poisons or toxic materials in plants growing in pastures.
- (3) Toxins in feeds.

BACTERIOLOGICAL STUDIES

Since the condition was an acute inflammation and since most acute inflammations of these parts are caused by infection, one's thoughts naturally incline to such as the cause. Attempts were made to transmit the disease by direct contact. Affected gilts removed from farms where the disease had developed were placed with small healthy gilts but failed to transmit the disease by contact. Healthy gilts so exposed remained normal throughout a six-weeks period of observation. During that period the affected gilts returned to nearly normal. Not only was this the case but following exposure the unaffected, exposed gilts were placed in yards with 25 other young pigs and the disease was not contracted by these animals over an observation period of six months.

Attempts were made to transmit the disease artificially. Affected gilts, during the height of the disease, were douched with 100 cc of normal saline solution. Such material came away only very slightly milky and in it were suspended numerous flaky particles. The collected douching fluid was, by means of a catheter and funnel, allowed to gravitate into the vagina of healthy gilts. Over an observation period of 6 weeks there was no indication that the disease had been transmitted. These exposed pigs were placed in a herd of young pigs and the disease did not develop during an observation period of six months.

Attempts also were made to transmit the disease to rabbits and guinea pigs. Affected gilts were douched with 100 cc of normal saline solution and such collected douching fluid was injected intraperitoneally into male and female guinea pigs and into male and female rabbits in doses varying from 1 to 3 cc each. None of these animals showed the slightest inconvenience and no local symptoms over an observation period of two months.

Bacteriological study of the vagina of affected pigs showed a streptococcus predominating. A coccus occurring in pairs also was present but to a less extent. A few polar-staining organisms also were present. These organisms, both in pure and mixed cultures, were injected intraperitoneally into both rabbits and guinea pigs without effect nor were there any local symptoms. Further study of these organisms was not made because it was

apparently evident that they were not the cause of the condition. Not only were they incapable of causing the disease but they were non-virulent for laboratory animals. It is interesting to note that the rod-shaped organism mentioned above corresponds morphologically and in its behavior toward guinea pigs to the organism isolated by Jones and Little, of the Rockefeller Institute for Medical Research, as the apparent cause of granular vaginitis of cattle.

In the various forms of infectious vaginitis of other animals the disease is very easily transmitted and it is usually our problem to determine how to prevent its spreading rather than to experience difficulty in causing it to do so. With this in mind, it would seem reasonable to assume that vulvovaginitis in gilts is not infectious. Further evidence is presented in that the disease occurred over large sections of the country almost simultaneously. There had been little or no traffic in hogs. On farms where the disease occurred there was no evidence to show that the disease was introduced with infected pigs or even from pigs not showing disease. We have few, if any, infectious diseases of any nature that spread so rapidly as did vulvovaginitis.

POISONOUS PLANT STUDIES

With infection apparently eliminated as a possible cause of the condition, it was thought that some toxic or poisonous plant might be responsible or that some plant, due to some unknown condition, had developed toxic or poisonous properties that would cause the condition. Perhaps this idea was partly entertained because of the cocklebur poisoning that had occurred only a few months before. The reports of the latter condition came from the states south of Iowa, then from southern Iowa, then central Iowa and finally in northern Iowa and disappeared into Minnesota and the North. It came like a wave from the South and continued in its direction to disappear in the North. Its occurrence was dependant on the germination of the burrs. Evidently the season was ideal for this.

First reports of vulvovaginitis were from the Southeast, although, as was learned later, cases occurred almost at the same time over large sections of the country. Many different plants were sent to Dr. L. H. Pammel, of the Botany Department, Iowa State College, for identification and for his opinion whether they would produce or ever had been known to produce vaginitis.

Trips to several farms were made. Fortunately only well-known plants were found and it was possible for Dr. Pammel to render a reliable statement without experimentation. Some of the plants were catnip (*Nepeta cataria*), the nettle-leaf vervain (*Verbena urticaefolia*), the Indian mallow (*Abutilon theophrastic*), and the dragon-head (*Dracophalum parviflorum*). Other plants examined were the small ragweed, sneeze weed, the common black nightshade, and the smart weed or pepper. Dr. Pammel writes:

While some of the plants are slightly toxic, they are not sufficiently so to cause the condition (vulvovaginitis) found in the animals. I have come to the conclusion that the trouble is not due to any weeds found.

He further intimates that all plants common to the localities were evidently found in his survey and that the condition is not due to any plants or changes in any plants growing in the pastures or yards. As further evidence to this effect it is to be noted that some of the hogs were not on pasture, some herds being confined in dry lots.

STUDIES OF FEEDS

Together with the above work, experiments with feed were carried out. All the various feeds, including grains and supplements, were regarded by different owners as the possible cause of the condition and in many cases the owners felt very sure that a certain feed was the cause. However, it was determined that the only feed given to all affected herds was corn and it appeared reasonable to investigate it first. We are indebted to a farmer, living near Dubuque, and to Dr. J. T. Gilloon, of Dyersville, Iowa, for our first definite information in regard to corn. On August 11, 1927, Dr. Gilloon wrote:

I am sending you a sack of corn which I think is the trouble. A farmer started to feed this corn and in a week all gilts were affected. He sold a load of the corn to another hog-raiser whose gilts also became affected. Another farmer, living near Dubuque, suspected his corn was at fault and bought corn until his hogs had recovered and when he returned to feeding his own corn the trouble promptly showed up.

On the evening of August 16, 1927, two gilts weighing 25 pounds each were given their first feed of the above corn and from that time on they were fed nothing but this corn and water. Six days later, or on August 22, it was found that the vulva of each was swollen to eight times its normal size. Two other normal gilts weighing 25 pounds were placed on the feed and kept under close observation. One of these gilts showed some swelling of the vulva within three days and both showed a marked

swelling in five days. The pigs were taken off feed when the condition showed in both. Another sample of 50 pounds of ear corn, crib-run from a different source, was fed to four pigs averaging 40 pounds without causing any ill effects. From feeding experiments with this sample of corn it was concluded that only the badly spoiled and molded corn produced the condition. In crib-run corn it would doubtless require a longer feeding period to produce the condition.

The substance that produces the trouble seems to be slightly cumulative. With this in mind we requested that selection be made of moldy ears from cribs. A sample of corn, received January 17, 1928, and fed on February 2 to two normal gilts of 48 pounds weight, produced swelling of the vulva in four days in one gilt that ate more readily and in the second gilt in six days. At six days the corn feeding was discontinued but swelling and enlargement of the vulva in each continued for four days longer until the organs were tense, smooth and tumefied. In the pig that first showed the condition, beginning prolapse of the vagina took place before the process began to subside.

No reports of the trouble have been made except where the pigs have been fed corn from the 1926 crop. The trouble was experienced with both white and yellow dent corn but only in case the corn was quite badly spoiled. Such samples appeared grossly as ordinary spoiled corn. Mold was very evident, but since molds on different feeds have so seldom been found to cause trouble it would seem more likely that spoilage due to organisms other than mold should be suspected rather than the more evident and more spectacular vegetable growth. Since it is not known what organism causes the detrimental changes in corn, it seems a little premature to say that vulvovaginitis is caused by moldy corn, unless that statement is based on the understanding that all naturally spoiled corn will necessarily be moldy. It would seem entirely proper to state that the condition is produced by spoiled corn.

The growing season for corn in the state of Iowa in 1926 was about 144 days, or a shorter period than the average. This was nearly uniform over the entire state. Since vulvovaginitis occurred in only one section of the State the growing season alone was not the main cause of spoilage, but it is true that the corn in northeast Iowa was more backward than in any other part of the State. Table I shows the quantity of corn matured without frost damage and the quantity of merchantable corn

for each section of the State, supplied through the courtesy of Chas. D. Reed, Director, Iowa Weather and Crop Service.

TABLE I—Data on merchantable corn

DISTRICT	PERCENTAGE OF CROP MERCHANTABLE	PERCENTAGE MATURED WITHOUT FROST DANGER
North East.....	54	52
North Central.....	71	67
East Central.....	72	67
South East.....	73	69
South Central.....	71	70
Central.....	77	72
West Central.....	79	75
South West.....	79	81
North West.....	80	78
State average.....	74	71

It will be seen from the table that those sections having the most trouble with vulvovaginitis also had the greatest percentage of poor corn. Most of the trouble was in the northeast district, some in the north central district and a little in the east central. For instance, Chickasaw County in the northeast district had only 35 per cent of its corn crop matured without frost damage and Fayette County only 36 per cent with only 37 per cent merchantable. In both these counties there was considerable trouble. This is to be compared with Fremont County, where there was no vulvovaginitis and where 87 per cent of the crop was merchantable and 89 per cent not injured by frost. Two counties, Blackhawk and Bremer, in the northeast district, had very little trouble from the disease and these had a high percentage of good corn not injured by frost. Another fact of interest in regard to the weather of 1926 is that September was the wettest and most cloudy of any September on record, which covers a period of 54 years. More rain fell in September than in any other one month of this or any other year during the period of observation in Iowa.

The question has been raised as to what effect the disease would have on breeding of recovered animals. Pure-bred raisers have been fearful that recovered gilts would not breed. Since the disease is confined to the more external portions of the genital tract and since following recovery there is no abnormality that could prevent breeding there seems to be no likelihood that the disease need be any factor in the breeding of recovered gilts.

CONCLUSIONS

Vulvovaginitis in gilts has been found apparently due to feeding spoiled corn but it cannot be said definitely that mold is responsible for the poisonous properties that develop.

BUREAU TRANSFERS

Dr. Henry Singleton (K. C. V. C. '06), from Houston, Texas, to Cedars, Miss., in charge of meat inspection.

Dr. Walter W. Shartle (Ind. '09), from Houston, Texas, to Baton Rouge, La.

Dr. Nelson D. Hatcher, Jr. (St. Jos. '20), from Baton Rouge, La., to Jackson, Miss., on tick eradication.

Dr. E. N. Moline (K. C. V. C. '11), from Jacksonville, Fla., to Jackson, Miss., on tick eradication.

Dr. Chas. E. O'Neal (K. S. A. C. '16), from Fort Worth, Texas, to Jackson, Miss., on tick eradication.

Dr. F. L. D. Herchenroeder, Jr. (St. Jos. '18), from Fort Worth, Texas, to Jackson, Miss., on tick eradication.

Dr. Fred E. Rambo (Ind. '11), from Baton Rouge, La., to Jackson, Miss., on tick eradication.

Dr. Fred H. Schaefer, from Kansas City, Kans., to Fort Dodge, Iowa, on virus serum control.

Dr. Charles Walter, from tuberculosis eradication to virus serum control, at Indianapolis, Ind.

Dr. John T. Draper, Jr. (K. C. V. C. '17), from meat inspection to virus serum control, at Omaha, Nebr.

Dr. Wilber C. Finn, Jr., from Omaha, Nebr., to Chicago, Ill., on meat inspection.

Dr. O. E. Allmon, from Chicago, Ill., to Sioux City, Iowa, on virus serum control.

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BOVINE SUBCUTANEOUS TUBERCULOSIS

By CHAS. A. MITCHELL, *Ottawa, Canada*

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Within recent years a large and increasing number of animals have been subjected to tuberculin tests, due to the various eradication measures adopted by different countries. This widespread application of tuberculin has brought with it many new problems in the field of tuberculosis control which previously went unobserved or seemed to have little bearing upon the subject, one of which is indicated by the title of this paper.

Subcutaneous tuberculosis—this has usually been referred to as skin lesions—compares in some respects with tuberculides of human beings. But this, unlike tuberculides, has received scant attention from clinician and research worker alike, until the various eradication measures and the resultant intensive study of tuberculosis forced this problem to the surface.

A perusal of the literature shows very little reference to this type of infection until recent years. In 1914, an extract was published in the JOURNAL of the American Veterinary Medical Association,¹ said to be from the French literature. In this extract was pointed out the rarity of the disease and also that the lymph-glands adjacent to the affected area were seldom involved.

In 1916, Traum² published an account of a disease which clinically somewhat resembles subcutaneous tuberculosis. It occurred in California and he believed it was caused by a streptothrix. In 1919, Traum³ described an organism which he isolated and which he believed to be the cause of the disease. Day,⁴ in 1922, recorded several cases which came under his observation. He also stated that he produced tuberculosis in guinea pigs inoculated with the lesions from cattle. Wright,⁵ in 1921, recorded seven cases and pointed out that the extremities were most often affected. Traum,⁶ in 1923, described the organism isolated by him and which he believed caused the majority of cases of subcutaneous lesions. Hastings, Beach and Weber,⁷ after studying twenty-three lesions and being unable to grow the organism or to infect laboratory animals, concluded the lesions were not due to the tubercle bacillus but possibly to an allied acid-fast organism.

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Carpenter and Goldberg⁸ believed that cutaneous lesions of cattle were identical with skin lesions of man. They also pointed out that the introduction of a small amount of bovine bacilli produced a lesion which resembled that found in natural infection. Elder and Lee⁹ also produced, with avian tubercle bacilli, lesions resembling natural infection. Calmette,¹⁰ in his text-book, points out that tuberculosis of the skin in cattle is exceedingly rare, and that acid-fast organisms found are of a very low virulence. Crawford,¹¹ in his excellent study of tuberculin sensitization by acid-fast organisms (other than tubercle bacilli), concluded that the reactions as a whole were inconsistent and decidedly atypical but in a few cases they closely paralleled specific tuberculin reactions.

About two years ago, the study of subcutaneous tuberculosis was commenced at this laboratory. It was deemed advisable in addition to the purely experimental work to collect all possible data with reference to the specimens and to tabulate them in such a form that light might be thrown on the epizootology of the disease and on its relationship to tuberculosis as a whole. Table 1 is self-explanatory and should be studied in connection with this paper.

It appears from table 1 that subcutaneous tuberculosis (1) sensitizes an animal to tuberculin, (2) localizes, as a rule, in the limbs and extremities, and (3) occurs when other lesions, organic and glandular, are either absent or present, but more often in their absence, and in the relative proportion of about 2:1.

CHARACTER OF LESIONS FOUND

The lesions thus studied have all been subcutaneous and may be dissected away from the skin proper. Occasionally a sinus connected with the surface but this was rather the exception than the rule. Nodules were frequently found in groups and sometimes from two to six were present in an affected area. These nodules were definitely separated from one another or might be loosely attached by bands of fibrous tissue. They varied in size from a hazel nut to that of a large hen's egg. There seemed to be no tendency for the disease to migrate by way of the lymphatic system and the adjacent lymph-nodes were never diseased. Each lesion was made up of a distinct and often thick yellow fibrous wall enclosing contents of varying character. Sometimes the contents were purulent, that is, they were made up of a thick tenacious odorless pus. Pus-forming organisms

are invariably present in this type of lesion and usually the acid-fast organisms are easily found in scrapings from the fibrous wall. The second type of lesion is one in which the contents resemble peanut butter. If a smear is made, the surface when dried has the appearance of a fine sandpaper. This is undoubtedly due to fine lime salts being present. This is the most common type of lesion found and it is usually extremely difficult to demonstrate the presence of acid-fast organisms.

The third type of lesion is one the fibrous wall of which encloses very coarse granular lime salts. I believe these are the oldest type of lesion encountered, and it is usually very difficult to find acid-fast organisms in them.

ACID-FAST ORGANISMS AND SUBCUTANEOUS TUBERCULOSIS

The acid-fast organisms found were presumed to be the cause of the disease. These presented even in the same lesion several different forms, the most common being a cocco-bacillus, usually occurring in pairs. Long forms were frequently present and, in many instances, had enlarged ends. Occasionally in the body of the bacillus an area would decolorize and take the counter stain. Round acid-fast bodies were often found, and frequently in association with spherical bodies which took the blue stain but appeared much darker than other material in the smear. It was at first thought that these bodies were spores of different kinds but as many of the specimens were sterile this explanation did not seem to be satisfactory. It was not until after reading Sweany's¹² description of granules of the tubercle bacillus and studying his color plates that these bodies assumed significance. Non-acid-fast organisms of innumerable kinds were found, although frequently lesions would contain no organism save the acid-fast bacillus.

Some authors have stated that subcutaneous lesions are not caused by the tubercle bacillus because they have not succeeded in infecting laboratory animals or in making isolation from the lesions. This view appears unsound, especially when we take into consideration the fact that acid-fast organisms in human tuberculides are altered in virulence for laboratory animals. It is possible that the bovine host under similar circumstances may alter the character of the organism to an even more marked degree. It seemed very probable that the acid-fast organisms in the lesions were the cause of the animals' sensitiveness to tuberculin, whether they were true tubercle bacilli or not.

Taking for granted that the acid-fast bacteria present were the cause of the lesions, the following hypotheses were laid down.

Subcutaneous lesions are caused by:

- (a) A strain of tubercle bacilli that had become altered in pathogenicity through its residence in the skin.
- (b) A strain of tubercle bacilli not conforming to any known type.
- (c) An organism separate and distinct from tubercle bacilli but capable of exciting sensitiveness to tuberculin.

Factors, such as those pointed out by Watson,¹³ that are common to all tuberculous infections—such as symbiosis, individual immunity and varying reactions of an animal to infection—doubtless enter the problem. But even these, conceivably, would not cancel the three hypotheses just mentioned. It was therefore clear that little progress could be made in studying this condition until an organism was isolated directly from subcutaneous lesions. To this end varying methods of cultivation were used in the hope that if the organism were other than a true tubercle bacillus we might discover some method of growing it. It was also considered possible (providing the infection was a true tuberculous one) that although many lesions might contain organisms which were attenuated or even dead, some lesions might harbor more pathogenic organisms and ones that might perhaps infect laboratory animals.

ATTEMPTS TO CULTIVATE ACID-FAST ORGANISMS DIRECT FROM TISSUE

Parts of subcutaneous lesions were prepared in three different ways for planting proper, that is, parts of lesions were dissected out under aseptic conditions and ground up finely with broken glass. Plants were made from the material prepared in this manner. Secondly, parts of lesions were simply teased out and smeared over the surface of the media. Thirdly, parts of the lesion were finely ground up and treated for 20 minutes with 15 per cent solution of antiformin. The tubes were all subjected to a temperature of 37° C., some being incubated aerobically, some anaerobically, and some under reduced oxygen tension. It was thought that by the above preparation of tissues and their submission to different conditions with regard to oxygen that all the reasonable factors covering this part of cultivation would be taken into account.

Several different kinds of media were employed: blood agar, glycerin agar, coagulated bovine serum, Dorset's egg medium with and without the addition of blood, digested egg with and without the addition of blood, M'Fadyean's medium for the cultivation of Johne's organism, and also three different media (1, 2 and 3*) which we designed hoping to supply the substances which might be needed for the cultivation of the bacillus in question. The inoculated tubes were not discarded until a period of nine months had elapsed from the date of planting them. Many different varieties of microorganisms were grown from the seedings made but none which retained the acid-fast stain. Two organisms were fairly consistently found. These were tested for pathogenicity but proved avirulent for laboratory animals. Not a single colony of acid-fast organisms came up from the numerous plants made.

ATTEMPTS TO TRANSMIT INFECTION TO CALF BY MEANS OF SUBCUTANEOUS LESIONS

A calf (131), female, three months old, was secured for experiment. It was tested with tuberculin and gave a negative reaction. On April 1, 1927, the right fore leg was shaved and scarified, and ground-up lesion 8668 was applied to the damaged skin, with a compressor bandage. Into the left hind leg macerated lesion 8668 was injected subcutaneously. For a few days there was slight swelling at the point of subcutaneous inoculation, but in ten days this had disappeared. The animal since has shown no evidence of infection. On April 28, a cow (K83144) that had well-defined skin lesions on the fetlock, also on the shoulder, was purchased. One-half the lesion was dissected aseptically from the shoulder, the other half being left in the hope that the disturbance would result in the formation of new lesion which might be used for cultivation while quite young.

The half dissected out was immediately divided into two parts. An incision was made in the left front leg of calf 121 and the lesion slipped beneath the skin, the incision being closed

**Medium No. 1:*

Eggs are blown into a sterile flask and broken up with beads, strained through sterile cheesecloth into a petri dish, heated at 73° C. for 3 hours the first day and 1 hour for the next two consecutive days. Small pieces of sterile muscle are then placed here and there over the coagulated egg. After inoculation with the suspected material, the plate is dampened with a 1% solution of trypsin.

Medium No. 2:

Liquid egg, as above prepared, 80%; sterile serum 10%; T. B. extract 10% (20% glycerin). Inspissated as No. 1.

Medium No. 3:

Liquid egg 70%; extract of T. B. 10%; sterile serum 10%; digested meat extract 10%. Inspissated as No. 1.

The digested meat extract is made by alkalizing sterile meat and adding 1% trypsin extract. Digested at 37° C. for 6 days.

with suture and bandaged. The other half was used for planting different media. Acid-fast organisms were found in this lesion. Calf 121 had a swelling at point of inoculation for two weeks, which gradually disappeared and to date has shown no evidence of infection. The removal of half of the lesion from cow K83144 had the opposite result from that hoped for, that is, instead of developing new lesions from the half left *in situ*, the portion left quickly disappeared and no evidence of re-infection has been noted.

ATTEMPTS TO INFECT LABORATORY ANIMALS

Guinea pigs and rabbits were inoculated and, in nine cases, chickens also were inoculated. Inoculations were made intraperitoneally and subcutaneously and in some cases the material in question was rubbed into the scarified skin. Attempts also were made to influence the resistance of the animal. For example:

(1) Animals were injected subcutaneously with dead tubercle bacilli. The resultant local abscesses were evacuated and into the cavities was placed a portion of the lesion under investigation.

(2) Animals were subjected to extreme cold as a possible means of lowering their resistance.

(3) Contagious abortion bacilli, and several varieties of organisms isolated from subcutaneous lesions were injected, followed by inoculation with material from the lesions in question. It was thought that perhaps some symbiotic relationship was necessary for the growth of the acid-fast organisms.

After many failures a rabbit (667) was successfully infected from lesion 8572 (see table). The guinea pig, which was inoculated at the same time, unfortunately died from pneumonia. The rabbit was inoculated intraperitoneally and died in 131 days.

POSTMORTEM OF RABBIT 667

The body generally was in a well-nourished condition. The lungs were a mass of small tubercles about the size of a pea. The liver presented a few very minute tubercles. The serous portion of the intestines in local areas was studded with a great many small tubercles. The serous surface of the body of the uterus and the horns was studded with small tubercles.

Tubercles were present in the cortex of the kidneys. Only one small gland showed any evidence of tubercle infection.

The strain was carried in laboratory animals and table II will give the information at a glance.

ISOLATION OF STRAIN

We did not succeed in isolating it from rabbit 667, but from guinea pig 723 we succeeded with difficulty in isolating it from the spleen, on egg media.

CHARACTER OF ORGANISM

The organism was found exceedingly difficult to grow. Even after four generations it still comes up on egg as very minute colonies, and so far we have been unable to obtain a growth on any other medium. These bacilli are acid-fast, and occur as very fine, small bacilli or frequently as cocco-bacilli. The animals infected with this organism react to bovine tuberculin (but not to avian) so it would seem that the bacillus is probably a bovine organism.

HISTORY OF HERD 8572

As this is of more than ordinary interest the full history of herd 8572 is given below.

Aug.	1922—tested—one reactor
Sept.	1923—tested—no reactors
Oct.	1924—tested—no reactors
Dec.	1925—tested—no reactors
Oct.	1926—tested—no reactors
Feb.	1927—tested—two reactors
April	1927—tested—no reactors

The two reactors in February, 1927, were both skin-lesion cases, and are referred to on the chart as 8572 and 8573.*

After approximately 100 attempts to infect guinea pigs and rabbits by the inoculation of material from subcutaneous lesions taken from 33 cattle had failed, rabbit 667 died of tuberculosis on the 131st day after inoculation. This and subsequent animal passages are shown in table II.

EXPERIMENTS UPON CALVES

1. Attempted infection by ingestion of tuberculous tissue of guinea pig 722 and rabbit 724 (second animal passage).

Calf 131: A young calf was procured for experiment. It was tested with bovine and avian tuberculins and gave a nega-

*In addition to this case, recently, a guinea pig was successfully infected from 8895; it died in 170 days with generalized tuberculosis. This strain to date has not been isolated and will not be further discussed in this report.

tive reaction. August 18, 1927, it was fed in milk 1 cc of pus which had been drawn from subcutaneous lesion of guinea pig 722. On August 26, 1927, it was again fed tuberculous material, this time a piece of ground-up lesion from rabbit 724. The animal continued to look healthy and remains in good condition to date. On October 6 it was given a dose of bovine tuberculin in the caudal fold and avian tuberculin in the perineal region. The animal gave a pronounced reaction (P5) to bovine tuberculin but did not react to avian. To see if a local inflammation would favor the development of subcutaneous lesions, an artificial injury was produced on one of the legs. Under aseptic conditions an incision was made and a sterile glass bead introduced beneath the skin. The wound was closed by suture. To date no lesion has occurred. The animal is being kept under close observation.

2. Attempted infection by subcutaneous inoculation of skin-lesion culture 8572 (second generation).

Calf 132: Tested with bovine and avian tuberculins, gave negative reactions.

A culture of tubercle bacilli, subcutaneous strain 8572, second generation, grown upon egg medium for 15 days, was washed off with 10 cc of normal broth. On September 8, 1927, 1 cc was injected into the skin of the left fore leg in the region of the metacarpal bone. For several days no evidence of infection was found but in about three weeks appeared a small hard swelling which has persisted since and now has the appearance of a skin lesion. October 8, 1927, the animal gave a well-marked reaction (P4) to bovine, but did not react to avian tuberculin.

One particular point will be noted from a study of lesions as indicated on the inoculation chart: the general tendency of the organism to colonize in the subcutaneous tissue of the rabbit, in addition to the internal organs, as takes place with a strain of the usual bovine type.

The work with cattle has not progressed far enough to make any deductions except that subcutaneous lesions may be produced by injecting the organism in pure culture beneath the skin.

DISCUSSION

I believe it has been the observation of those familiar with the tuberculin reaction obtained in animals suffering from subcutaneous tuberculosis, that on the whole they do not react as markedly as animals suffering from other forms of tuberculosis. In so far as we are at present able to tabulate these cases, about

TABLE I.—Data on cases of subcutaneous tuberculosis.

ANIMAL	SEX	AGE (YRS.)	INTRA- DERMAL TUBER- CULIN REACTION	SUBCUTANEOUS LESIONS		OTHER LESIONS	CATTLE ON PREM- ISES	REACTORS	ANIMALS DESTROYED	LESIONS IN OTHER REACTORS IN SAME HERD
				LOCATION	ACID- FAST ORGAN- ISMS					
7012	F	7	P	Rt. hind leg	Yes	None	25	1	1	No visible lesion.
7013	F	8	P	Rt. hind leg	Yes	Bronchial	18	1	1	
7014	F	9	P	Left hind leg	Yes	None	15	2	2	
7015	F	10	P	Rt. hind leg	Yes	None	8	1	1	
7160	F	4	P	Rt. fore leg	None	Lungs; bronchial, mediastinal and retro-pharyngeal	29	5	5	1. No visible lesion. 2. Bronchial and mediastinal. 3. Pharyngeal and mesenteric. 4. Bronchial and mediastinal.
7261	F	12	P	Sternum	None	Lungs; pleura and mediastinal	31	4	4	1. Lungs, pleura. 2. Bronchial. 3. No visible lesion.
8188	M	2	P	Femoral	Yes	None	36	1	1	
8200	F	8	P	Metacarpal	None	None	22	1	1	
8367	F	4	P	Metacarpal	Yes	Bronchial and prescapular	57	4	4	1. Retropharyngeal. 2. Lungs. 3. Bronchial and precutural.
8442	F	6	P	Tibial	Yes	Bronchial, retropharyngeal	40	8	8	1. Mediastinal and retro-pharyngeal. 2. Lungs. 3. Lungs.
8443	F	6	P	Thigh	Yes	Bronchial, mediastinal	40	8	8	4. Lungs. 5. Lungs, bronchial and mesenteric. 6. Lungs, bronchial and mesenteric.
8445	F	2	P	Metacarpal	None	None	36	2	2	1. Lungs.

TABLE I—Continued.

8474	F	3	P	Metatarsal	None	Retropharyngeal	24	1	1	
8572	F	3	P	Metatarsal	Yes	None	57	2	2	1
8573	F	3	P	Metacarpal	Yes	None	57	2	2	2
8668	F	4	P	Metacarpal	Yes	None	18	1	1	1
8684	F	5	P	Metacarpal	Yes	None	38	3	3	3
8688	F	9	P	Metacarpal	Yes	None	24	2	2	2
8866	M	2	N	Rt. hind leg	None	None	26	0	0	1
8895	F	3	P	Shoulder	Yes	None	31	1	1	1
8924	F	3	P	Abdomen	Yes	None	72	3	3	3
9129	F	3	P	Shoulder	Yes	None	31	2	2	2
9131	F	?	P	Rt. hock	Yes	None	26	1	1	1
9161	F	5	P	Tibial	Yes	None	25	7	7	7
9169	F	4	P	Metatarsal	None	None	9	2	2	2
9171	F	7	P	Metacarpal	Yes	None	9	2	2	2
9172	F	5	P	Metacarpal	Yes	None	14	1	1	1
9173	F	6	P	Shoulder	Yes	None	50	3	3	3
9174	F	7	P	Metatarsal	Yes	None	14	2	2	2
9175	F	3	P	Metacarpal	None	None	14	2	2	2
9176	F	3	P	Metacarpal	Yes	None	15	2	2	2
9177	F	5	P	Metacarpal	Yes	None	11	1	1	1
9224	F	7	P	Metatarsal	None	None	13	1	1	1

1. Mediastinal.
2. Mesenteric.
1. Bronchial.

1. Mediastinal.
2. Mediastinal.
1. Submaxillary.

1. Bronchial and mediastinal.
2. Bronchial and mediastinal.
3. Bronchial and mediastinal.
4. Bronchial and mediastinal.
5. Bronchial and mediastinal.
6. Bronchial and mediastinal.
1. No visible lesion.
1. No visible lesion.

1. Bronchial.
2. No visible lesion.
1. No visible lesion.
1. No visible lesion.
1. No visible lesion.

TABLE IA—*Analysis and summary of table I.*

HERDS TESTED	ANI- MALS TESTED	RE- ACTORS	SUBCU- TANEOUS LESIONS ONLY	SUBCUTANEOUS LESIONS PLUS OTHER LESIONS	LESIONS OTHER THAN SUBCUTANEOUS	NO VISIBLE LESION
29	798	67	23	10	26	8
		8.4%	2.9%	1.2%	3.2%	1.0%
			4.1%			

70 per cent react less severely to tuberculin than animals in the same herd affected with other tuberculous lesions. In fact for a time I was inclined to believe these subcutaneous lesions were not tuberculous but were caused by a closely related organism and that the reaction was in the nature of a group reaction and consequently less marked. The initial failures to infect laboratory animals or to cultivate the acid-fast organisms from the infected tissue seemed to support this view. I am not prepared to accept this interpretation now, but look upon the lesions as truly tuberculous, although possibly caused by a strain somewhat atypical in its selection of unusual tissue for colonization. It will be noted that laboratory animals were infected from but two out of thirty-three (6.06 per cent) natural clinical cases of subcutaneous tuberculosis, and these were both from young animals. I believe there is more than coincidence in this. A possible explanation is that the lesions were young and the organisms had not been harbored long enough to become attenuated. When lesions become older the organisms are probably attenuated or dead. The result is that they do not infect laboratory animals and are unable to grow on culture media, although the animal harboring the lesions which they have caused is still sensitive to tuberculin in varying degrees. At the same time it must be kept in view that no two animals are likely to influence a strain in an exactly similar manner, as examples, animals 8572 and 8573. The lesions on these animals occurred in precisely the same location and appeared in a similar stage of development, the animals were the same age and the source of infection was doubtless the same, but one lesion infected laboratory animals while the other did not. This would seem to be due to a difference in the mechanism of defense in the two animals and its effects upon the organism rather than to any marked difference in the age of the lesions.

TABLE II—*Subcutaneous lesion 8572—Inoculation experiments on laboratory animals*

ANIMAL PASSAGE	ANIMAL		ROUTE	DEATH (DAYS)	INOCULUM	LESIONS
	No.	SPECIES				
1st	666	G.P.	Intrap.	18	8572 Subcut. lesion of cow	Pneumonia Lungs, spleen, liver, intestines and uterus
	667	Rabbit		131		
2nd	721	Rabbit	Subcut.	55	Lung of rabbit 667	Lungs, kidneys, spleen (slight). Subcutaneous lesion at point of inoculation. No lymph- glands affected.
	722	G.P.	Subcut. (Rt. groin)	56		Lungs, liver, spleen and sub- cutaneous right shoulder
	723	G.P.	Intrap.	21		Lungs, liver, spleen and lum- bar glands
	724	Rabbit	Intrap.	51		Lungs, kidneys, intestines, peritoneum, pancreas and two subcutaneous lesions
3rd	741	Rabbit	Intrap.	93	Pus from guinea pig 722	Subcutaneous right abdomen, lungs and kidneys
	743	Rabbit	Oral	28		Small lesions on cecum
	744	Rabbit	Oral	15		No lesions found
	745	Rabbit	Subcut.	11		Sepsis
	746	Rabbit	Subcut.	10		Sepsis
	747	Rabbit	Subcut.	75	Culture from spleen of guinea pig 723	Subcutaneous lesion on leg, lungs and kidneys
	748	Rabbit	Subcut.	69		Subcutaneous lesion on leg, lungs and kidneys
	749	Rabbit	Oral	K.105		Subcutaneous and also skin in the lumbar region, lungs, kid- neys and intestines
	750	Rabbit	Oral	K.106		Lungs, kidneys and intestines
	759	G.P.	Subcut.	74	Lung of rabbit 721	Local glands, liver, spleen and lungs
	760	G.P.	Intrap.	25		Liver, spleen, lungs and bron- chial gland
	761	G.P.	Subcut.	7		Pneumonia
	762	G.P.	Intrap.	5		Hemorrhage in peritoneal cavity
4th	7229	Chicken	Intrap.	K. 50		No lesions found
	756	Rabbit	Intrav.	21	Lung of rabbit 724	Lungs infiltrated. Miliary tubercles in spleen
	780	G.P.	Intrap.	17	Pus from rabbit 747	Skin moderately affected
	751	Rabbit (Contro	Oral Inocul	K.153 ation)	Laboratory strain of bo- vine tubercle bacillus 100 (for compar- ison and control)	Lungs, kidneys and intestines

The route by which animals are infected is of much interest and importance. That animals may be infected through the skin by punctured wounds is without doubt true, in fact, experiments with calf 132 demonstrates this. In the case of badly infected herds, such as cow 7160, there seems very good reason for believing that animals may be infected through constant contact with excreta laden with tubercle bacilli, and which possibly gain entrance to the subcutaneous tissues by punctured wounds made by sharp instruments, or by fissures which may be produced in the skin. That this is the only means of infection seems improbable. From a study of the epizootology of the disease, as illustrated by such examples as cases 8572 and 8573 (these are representative of many of our cases), it will be noted that the animals affected were never, so far as known, in contact with known tuberculous cattle. Since these animals were taken out the herd has been free from reactors. We may therefore presume, so far as these cattle are concerned, that they were not standing in excreta harboring tubercle bacilli. Had an open-case-ceased-reactor been present, other cases of tuberculosis would have subsequently occurred. The history shows that this has not taken place. There is a possibility which might be mentioned, that is, if an animal may harbor tubercle organisms of altered virulence without the production of lesions or sensitiveness to tuberculin and disseminate these organisms, it would perhaps explain the source of bacilli for excretal contamination and therefore subcutaneous inoculation.

We must not forget that animals other than cattle are usually present on the premises. These may harbor organisms and be sources of infection. It is difficult to believe, however, that sufficient organisms would be excreted to supply material for intracutaneous infection without at the same time infecting animals in the usual manner unless the strain in question had a predilection for the subcutaneous tissues. To sum up, while subcutaneous-lesion cases are doubtless caused by infection through the skin with material harboring the tubercle bacillus, other cases have been found in which this explanation is not satisfactory and it would seem that the explanation of these cases is that the organism in question has a tendency to colonize in the subcutaneous tissue irrespective of the avenue of infection.

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REFERENCES

- ¹Editorial: Subcutaneous tuberculosis. Amer. Vet. Rev., xlv (1914), pp. 261-262.
²Traum, J.: Case reports of lymphangitis in cattle caused by an acid-fast organism. Jour. A. V. M. A., xlix (1916), n. s. 2(2), pp. 254-257.
³Traum, J.: Further report on lymphangitis in cattle caused by an acid-fast organism. Jour. A. V. M. A., lv (1919), n. s. 8 (5), pp. 639-652.
⁴Day, L. E.: In Proc. 26th Ann. Meet., U. S. Live Stock San. Assoc., 1922, pp. 46-48.
⁵Wright, W. D.: Tuberculosis cutis. Jour. A. V. M. A., lxx (1921), n. s. 12 (5), pp. 598-608.
⁶Traum, J.: Corn. Vet., xlii (1923), pp. 240.
⁷Hastings, E. G., Beach, B. A., & Weber, C. W.: No-lesion and skin-lesion tuberculin-reacting cattle. Jour. A. V. M. A., lxxvi (1924), n. s. 19 (1), pp. 38-42.
⁸Carpenter, C. M., & Goldberg, S. A.: A study of skin tuberculosis. Corn. Vet., xv (1925), 2, pp. 148-155.
⁹Elder, C., & Lee, A. M.: Injection of cattle with *B. tuberculosis* (avian) and results of subsequent tuberculin tests. Jour. A. V. M. A., lxxiv (1924), n. s. 17 (4), pp. 440-450.
¹⁰Calmette, A.: Tubercle Bacillus Infection and Tuberculosis in Man and Animals (Williams & Wilkins Company, Baltimore, 1923).
¹¹Crawford, A. B.: Tuberculin sensitization in guinea pigs caused by various acid-fast organisms. Jour. A. V. M. A., lxxix (1926), n. s. 22 (5), pp. 579-588.
¹²Sweany, H. C.: The granules of the tubercle bacillus. Amer. Rev. Tuber., xvii (1928), 1, pp. 53-76.
¹³Watson, E. A.: Tuberculosis research. Jour. A. V. M. A., lxxi (1927), n. s. 24 (6), pp. 732-741.

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PRELIMINARY REPORT OF MORE THAN A YEAR'S WORK WITH BOTULINUS ANATOXIN

By C. E. SALSBERY AND G. E. JACOBI

Kansas City, Mo.

After more than a year of continuous work with botulinus anatoxin, during which time we have collected a large amount of data, we are pleased to offer this condensed report of some of the work accomplished. The amount of space placed at our disposal in this issue of the JOURNAL forces us to curtail this report of the results of the work very much.

During the four or five years just past, so much investigational work has been done with anatoxins in general and so much accomplished in an experimental way, that the subject is rapidly gaining world-wide interest. A review of this work shows that it is of more than passing interest, because in human medicine it has been applied in a practical way, especially in Canada, where anatoxins have been used in a great many cases to immunize people, mostly children, against diphtheria.

The anatoxins in tetanus, diphtheria and botulism have proven to be very effective immunizing agents and while the work has been mostly of an experimental nature, yet it appears to be an accomplished fact. So far as botulism is concerned, we feel that the matter of dosage for use in the field is the only phase of the subject that still requires further investigation. Our work at this time is being directed with that object in mind. We have, beyond doubt, established the fact that animals may be successfully immunized experimentally, after having used a large number of guinea pigs, rabbits, chickens, cattle and horses.

The details of this work must be left for another paper. A complete report to date would require much more space than is immediately available. The accompanying tables without explanation, show only a part of the testing program. We are including only those that require no comment. The completed report which we hope to publish later will include numerous other experimental tests with variations that will be fully discussed. We might add that the tables covering the early work are not included, since they are considered more in the light of "range-finders." They will all be published later.

We have felt that this preliminary report would be of much more interest, having little reading matter and more of the actual results in the form of test-charts.

TABLE I—*Type C anatoxin in guinea pigs*

G. P.	INJECTION OF ANATOXIN		INJECTION OF TOXIN		RESULTS
	DATE	DOSE (CC)	DATE	M.L.D.	
1	8-17-27	1.0	8-31-27	1500	Lived
3	Control		8-31-27	1500	D. 23 hours
2	8-19-27	5.0	8-31-27	7500	Lived
4	Control		8-31-27	7500	D. 21 hours

M. L. D. of unmodified toxin—0.0001 cc.

TABLE II—*Type C anatoxin in guinea pigs*

G. P.	INJECTION OF ANATOXIN		INJECTION OF TOXIN		RESULTS
	DATE	DOSE (CC)	DATE	M.L.D.	
5	8-22-27	1.0	9-8-27	1500	Lived
6		1.0		1500	Lived
7		1.0		1500	D. 91 hours
8	Control		9-8-27	1500	D. 25 hours

M. L. D. of unmodified toxin—0.0001 cc.

TABLE III—*Type B anatoxin in guinea pigs*

G. P.	INJECTION OF ANATOXIN		INJECTION OF TOXIN		RESULTS
	DATE	DOSE (CC)	DATE	M.L.D.	
3	11-2-27	1.0	11-18-27	2800	Remained well
7		1.0		2800	Remained well
10		1.0		2800	Remained well
18		1.0		2800	Remained well
20		1.0		2800	D. less than 24 hours
24	Controls			2800	D. less than 24 hours
25				2800	D. less than 24 hours

M. L. D. of unmodified toxin—0.0000357 cc.

TABLE IV—*Type B anatoxin in guinea pigs with increasing doses of toxin*

INJECTION OF ANATOXIN			EXPOSURE TO TOXIN		
G. P.	DATE	DOSE (CC)	DATE	M.L.D.	RESULTS
15	8-22-27	1.0	9-8-27	500	Remained well
16		5.0		500	Remained well
10	Control			500	D. 23 hours
24	8-22-27	1.0		1250	Remained well
18		5.0		1250	Remained well
20	Control			1250	D. 18 hours
25	8-22-27	1.0		2500	Remained well
19		5.0		2500	Remained well
22	Control			2500	D. 16 hours

M. L. D. of unmodified toxin for guinea pigs—0.0002 cc.

TABLE V—*Type C anatoxin in rabbits*

RABBIT	INJECTION OF ANATOXIN		EXPOSURE TO TOXIN		RESULTS
	DATE	DOSE (CC)	DATE	M.L.D. (G. P.) *	
5	11-5-27	1.0	11-18-27	5000	Remained well
6		1.0		5000	Remained well
9		1.0		5000	Remained well
11		1.0		5000	Remained well
21		1.0		5000	Remained well
24		1.0		5000	Remained well
10	Controls			5000	D. less than 24 hours
17				5000	D. less than 24 hours

*M. L. D. of unmodified toxin for guinea pigs—0.0002 cc.

TABLE VI—*Type C anatoxin in rabbits*

RABBIT	INJECTION OF ANATOXIN		INJECTION OF TOXIN		RESULTS
	DATE	DOSE (cc)	DATE	M.L.D. (G. P.)*	
1	8-24-27	2.0	9-8-27	15000	Lived
2		2.0		15000	Lived
3		2.0		15000	Lived
4		5.0		15000	Lived
5		5.0		15000	Lived
6		5.0		15000	Lived
7	Controls			15000	D. 28 hours
8				15000	D. 29 hours

*M. L. D. of unmodified toxin for guinea pigs—0.0001 cc.

TABLE VII—Horse immunized with polyvalent anatoxin A, B and C, later exposed at intervals to toxins A, B and C

HORSE	INJECTION OF ANATOXIN			EXPOSED TO TOXIN			RESULTS
	DATE	DOSE (cc)	TYPE	DATE	G.P. M.L.D.	TYPE	
140	10-19-27	12.5	A				
		2.7	B				
		15.0	C				
	11-18-27	12.5	A				
		2.7	B				
		15.0	C				
				11-28-27	7000	B	Remained well
				12-14-27	12000	A	Remained well
				12-22-27	50000	C	Remained well
146	Control on B			11-28-27	7000	B	Died, 56 hours
4				12-14-27	12000	A	Died, 73 hours
45				12-22-27	50000	C	Died, 96 hours

M. L. D. of unmodified toxin type A for guinea pigs—0.000166 cc.

M. L. D. of unmodified toxin type B for guinea pigs—0.0000357 cc.

M. L. D. of unmodified toxin type C for guinea pigs—0.0002 cc.

TABLE VIII—Type B anatoxin in calves

CALF	INJECTION OF ANATOXIN		EXPOSURE TO TOXIN		RESULTS
	DATE	DOSE (cc)	DATE	M.L.D. (G. P.)*	
13	9-29-27	2.5	10-15-27	70000	Remained well
14		2.5		70000	Remained well
124	Control			70000	D. 100 hours

*M. L. D. of unmodified toxin for guinea pigs—0.0000357 cc.

TABLE IX—Vaccinating a calf at different intervals with botulinus anatoxins A, B and C

CALF	INJECTION OF ANATOXIN			EXPOSED TO TOXIN			RESULTS
	DATE	DOSE (cc)	TYPE	DATE	M.L.D. (G. P.)	TYPE	
11	8-24-27	15.0	B	9-10-27	70000	B*	Remained well D. 76 hours
12		Control			70000		
11	9-29-27	10.0	C	10-15-27	150000	C†	Remained well Chronic botulism
125		Control‡			150000		
11	11-7-27	12.5	A	11-23-27	120000	A‡	Remained well D. 80 hours
13		Control			120000		

*M. L. D. of unmodified toxin for guinea pigs—0.0002 cc.

†M. L. D. of unmodified toxin for guinea pigs—0.0001 cc.

‡M. L. D. of unmodified toxin for guinea pigs—0.000166 cc.

§Ninety-six hours after exposure to "C" toxin, the control did not appear to be very sick, so another dose of 75,000 M. L. D. was given to both calves, 10-19-27. 10-20-27 control was down, unable to rise, showing marked paralysis and remained so for 15 days before being destroyed (chronic form). The vaccinated calf remained well.

TABLE X—Calves vaccinated and exposed to A and B botulinus toxins

	INJECTION OF ANATOXIN			EXPOSED TO TOXIN			
CALF	DATE	DOSE (CC)	TYPE	DATE	M.L.D. (G. P.)	TYPE	RESLUTS
205	5-28-28	14.0	A	6-19-28	90000	A	Remained well
		1.7	B		50000	B	
206		14.0	A		90000	A	Remained well
		1.7	B		50000	B	
207		14.0	A		90000	A	Remained well
		1.7	B		50000	B	
208		14.0	A		90000	A	D. 88 hours
		1.7	B		50000	B	
209		14.0	A		90000	A	Remained well
		1.7	B		50000	B	
210		14.0	A		90000	A	K. 6-30-28. Com- plete paralysis
		1.7	B		50000	B	
283	Control—Type A				90000	A	D. 76 hours
284	Control—Type B				50000	B	D. less than 65 hrs.
285	Control—Types A and B				90000	A	D. less than 65 hrs.
					50000	B	
286	Control—Types A and B				90000	A	D. 70 hours
					50000	B	

M. L. D. of un modified Type A toxin for guinea pigs—0.000166 cc.

M. L. D. of un modified Type B toxin for guinea pigs—0.00002 cc.

TABLE XI—Chickens on botulinus anatoxin Type "C"

BIRD	INJECTION OF ANATOXIN		INJECTION OF TOXIN		RESULTS
	DATE	DOSE (cc)	DATE	M.L.D. (G. P.)	
6	10-19-27	1.0	11-4-27	15000	Remained well
7		1.0		15000	Remained well
8		1.0		15000	Remained well
9		1.0		15000	Remained well
10		1.0		15000	Remained well
1574	Controls			15000	D. Botulism
38				15000	D. Botulism

M. L. D. of unmodified toxin—0.0002 cc.

TABLE XII—*Chickens vaccinated with anatoxin and exposed to botulinus A toxin*

BIRD	INJECTION OF ANATOXIN		EXPOSED TO TOXIN		RESULTS
	DATE	DOSE (cc)	DATE	M.L.D. (G. P.)	
407	12-10-27	2.0	1-12-28	300	Lived
408		2.0		300	Lived
411		2.0		300	Lived
413		2.0		300	Lived
415		2.0		300	Lived
416		2.0		300	Lived
417		2.0		300	Lived
418		2.0		300	Lived
419		2.0		300	Lived
420		2.0		300	Lived
421		2.0		300	Lived
423		2.0		300	Lived
424		2.0		300	Lived
427		2.0		300	Died
462		2.0		300	Lived
59	Controls			300	D. 72 hours
60				300	D. 72 hours
61				300	D. 96 hours

M. L. D. of unmodified toxin for guinea pigs—0.0002 cc.

TABLE XIII—*Chickens vaccinated and exposed to type A botulinus toxin*

BIRD	INJECTION OF ANATOXIN		EXPOSED TO TOXIN		RESULTS
	DATE	DOSE (cc)	DATE	M.L.D. (G. P.)	
62	11-17-27	2.0	1-12-28	300	Lived
63		2.0		300	Lived
64		2.0		300	Lived
65		2.0		300	Died
66		2.0		300	Lived
67		2.0		300	Lived
68		2.0		300	Lived
69		2.0		300	Lived
70		2.0		300	Lived
71		2.0		300	Lived
72		2.0		300	Lived
73		2.0		300	Lived
74		2.0		300	Lived
75		2.0		300	Lived
76		2.0		300	Lived
59	Controls*			300	D. 72 hours
60				300	D. 72 hours
61				300	D. 96 hours

M. L. D. of unmodified toxin for guinea pigs—0.0002 cc.

*These chickens were exposed at same time as those in table XI, hence, the same controls apply to both tests.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

ENCEPHALITIS IN CALVES*

By FRANK P. MATHEWS, *Lafayette, Ind.*

Department of Veterinary Science, Purdue University Agricultural Experiment Station

One hundred head of short-yearling, Hereford calves were shipped from Texas and placed in the feed-lot about December 1,

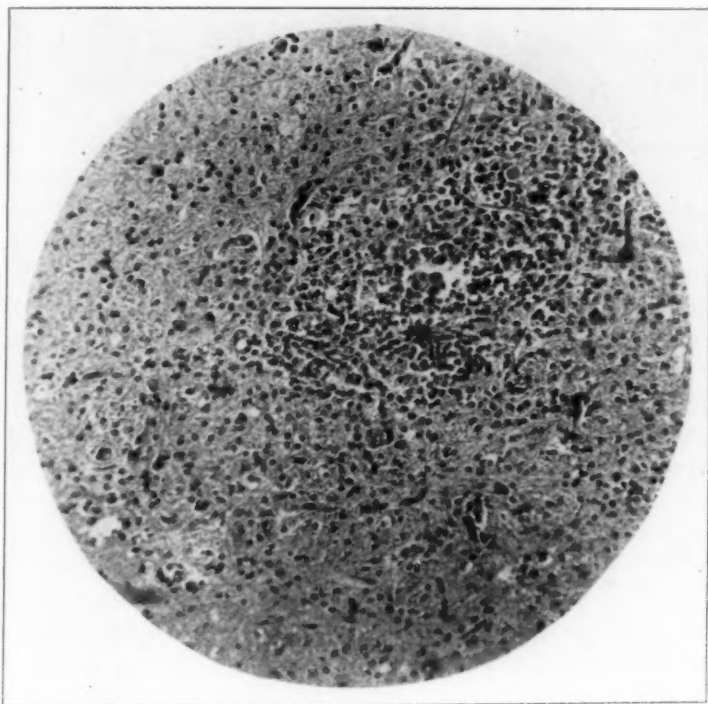


FIG. 1. Photomicrograph of section of medulla, showing a degenerated area filled with large mononuclear leucocytes. The leucocytes show a remarkable vacuolation of the cytoplasm.

1927. Ten head died of so-called shipping fever within three weeks from the date of arrival. The shipping fever subsided by

*These cases were brought to the attention of the writer by Dr. J. T. Redmon, of Covington, Ind.

the end of the third week, and for 25 days the calves were apparently in good condition. At this time (46 days after arrival) one calf went "off feed" and four similar cases developed during the next week. A second lot of Aberdeen Angus calves were maintained upon the same farm but in a feed-lot which was separated from the first lot by about a half-mile. No losses occurred in the second lot although part of the Angus calves had been shipped from Texas along with the Hereford calves. Each feed-lot was equipped with its own silo, from which ensilage was obtained. Otherwise, the rations for each lot were the same. The ensilage which was being fed to the Herefords was quite moldy, and for this reason about 75 pounds were carefully selected for the presence of mold and fed to a horse but with negative results.

Symptoms: The five cases that developed during the sixth and seventh weeks after they were placed in the feed-lot manifested symptoms which commonly lead to a diagnosis of "forage poisoning." The affected animals first refused food and water and separated themselves from the rest of the herd. They wandered aimlessly about the feed-lot and at irregular intervals would stand with their heads lowered and pushed against the fence or the side of the barn. Deglutition was evidently impaired, as their mouths were partly filled with masticated roughage. Decubitus developed within three to seven days after the onset of the first symptoms and was followed by coma and a fatal termination in from two to three days. One animal manifested a palsic shaking of the head for some time before death.

Postmortem examination: The autopsy findings were of little diagnostic importance. There was a mild pharyngitis which might have been produced by the passage of the stomach-tube. The mucosa of the small intestines and abomasum showed a marked congestion. Otherwise the abdominal and thoracic organs were negative. The central nervous system also appeared to be free from gross lesions. A complete set of tissues from one case and the central nervous system of a second were obtained for microscopic study.

Microscopic examination: The mucosa and submucosa of the pharynx, abomasum and small intestines showed a marked congestion. Large numbers of polymorphonuclear leucocytes, and much phagocytized hemosiderin were found in some of the mesenteric lymph-glands. There was an albuminous degeneration of the kidneys. With these exceptions, the abdominal and thoracic organs were free from pathological changes. The cerebrum,

cerebellum and spinal cord were essentially negative. In the medulla there was a perivascular round-cell infiltration, which consisted of lymphoid and large mononuclear leucocytes. Many of the nerve tracts in the medulla showed degenerated areas which were accompanied by a pronounced cellular reaction. The cellular reaction in the early lesions consisted principally of large mononuclear leucocytes, but in the more advanced lesions polymorphonuclear leucocytes were quite numerous. The cyto-

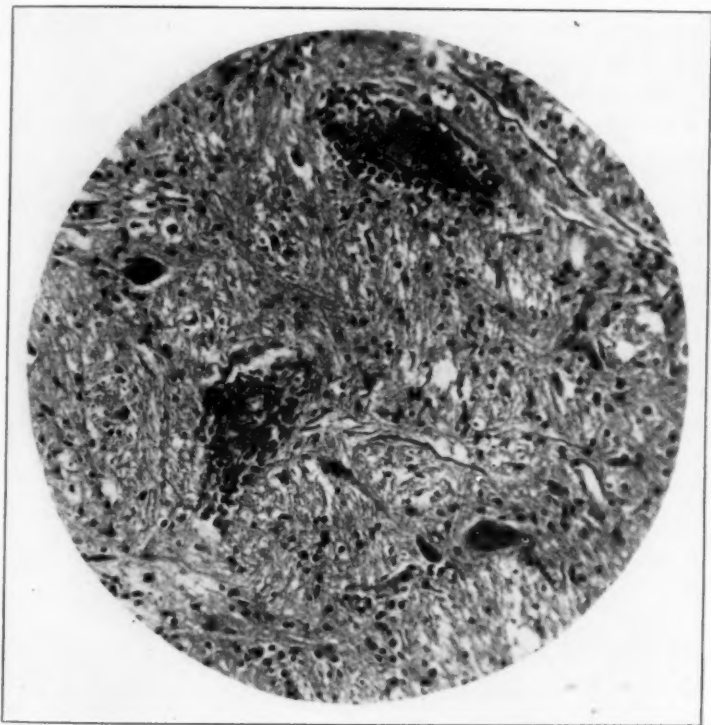


FIG. 2. Photomicrograph of a section from the medulla, showing a perivascular round-cell infiltration.

plasm of most of the mononuclear leucocytes showed a remarkable vacuolation. The ganglion cells adjacent to the degenerated areas were also involved in the retrograde process.

Diagnosis: The microscopic findings are similar to the changes found in other nervous diseases, which are known to be of infectious origin. Since in some cases these diseases are known to have long incubation periods, it is probable that the calves in this case were infected before entering the feed-lot. The moldy

ensilage was evidently incidental. In some respects these cases resemble the bulbar paralysis of Hutyra and Marek, but the clinical and pathological manifestations suggest encephalitis associated with lethargic symptoms as the most appropriate diagnosis.

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POSSIBLY HYPOGLYCEMIA*

By O. N. SCHULTZ, Latimer, Iowa

The subject was a high-producing Jersey cow; the condition developed following her sixth calving and her third successive attack of parturient paresis. Recumbency and almost complete coma developed twelve hours after calving. The cow was found in this condition at 2:00 a. m., December 7. The udder was inflated and $\frac{3}{8}$ grain of strychnin sulphate was injected subcutaneously. As the quarters in which she was confined were very cold (about 10 degrees below zero) and a blizzard raging outside, several jugs filled with warm water were placed about the body and the animal heavily blanketed. The case was seen again at 9:00 a. m., at which time she was on her feet but presented a drowsy appearance and her gait was uncertain. However, no treatment was given at this time. At 3:00 p. m. the animal was down again and in about the same condition as when first seen. The udder was again inflated and $\frac{1}{2}$ grain of strychnin injected subcutaneously. As the animal had not had a bowel movement, the rectum was emptied (largely for the owner's benefit).

At 9:00 p. m., the cow was reported to be on her feet. She was dull and moved with difficulty. At 2:30 a. m. the next morning, I was informed that the cow was again unable to rise. I decided that something else than inflation of the udder was required and that the glucose treatment would be tried. However, this was not done until 8:00 a. m. The usual recommended dosage of glucose was injected into the jugular vein, the udder re-inflated, $\frac{1}{2}$ grain of strychnin injected subcutaneously and the animal catheterized at this time. At 2:00 p. m., the cow

*Presented at the fortieth annual meeting of the Iowa Veterinary Medical Association, Des Moines, January 17-19, 1928.

was in deeper coma than ever and looked like a hopeless case. However, $\frac{1}{2}$ grain of strychnin was injected again and as I did not have time for further treatment, I returned two hours later and although the case looked bad there were slight signs of improvement. Double the usual dosage of glucose was injected intravenously, the udder re-inflated and another $\frac{1}{2}$ grain of strychnin injected subcutaneously.

A hypodermic syringe and a tube of $\frac{1}{2}$ -grain strychnin tablets were left for the owner to inject every two hours. This was done at 6:00 p. m., but at 8:00 p. m. the owner telephoned me that he could not catch the cow to give the injection and that she was then brighter than at any time since she took sick. The next morning I was informed that the animal would eat and drink and had had a bowel movement. What affected recovery? I personally feel that pushing the strychnin injections was responsible, but maybe the glucose was of value.

I practice in a dairy district and treat a large number of cases of milk fever each year and have never failed, until this case, to affect recovery with the air treatment supplemented with strychnin. (Some have required a second treatment.) I think the latter has merits, because when I have used atropin, camphorated oil, or nothing, response has always been slow. In the Jersey and the Guernsey breeds, $\frac{1}{2}$ grain of strychnin often causes a super-sensitiveness or even mild spasms, but these are never alarming.

ON THE WAY TO MINNEAPOLIS



Corkscrew Bridge—On the Cody Road to Yellowstone Park.

ABSTRACT

A STUDY OF THE BLACKTONGUE—PREVENTIVE ACTION OF 16 FOODSTUFFS WITH SPECIAL REFERENCE TO THE IDENTITY OF BLACKTONGUE OF DOGS AND PELLAGRA OF MAN. Joseph Goldberger, G. A. Wheeler, R. D. Lillie and L. M. Rogers. U. S. Public Health Reports, xliii (June 8, 1928), 23, pp. 1385-1454.

In a previous publication the authors found that blacktongue of dogs was due to a deficiency in diet and that yeast contained something which was capable of correcting this deficiency. Continuing their work with different foodstuffs, as a source of this blacktongue preventive, the following summary and conclusions were made:

The blacktongue-preventive potency of 16 foodstuffs has been studied and correlated to the pellagra-preventive potency (or lack of it) of those, eleven in number, for which this was known, with the following results:

Maize, if it contains any, is a poor source of the preventive for both blacktongue and pellagra.

Whole wheat contains the blacktongue preventive, but in small amount.

Commercial wheat germ contains, and may be rated as a relatively good source of, the preventive for both blacktongue and pellagra.

The *cowpea* contains, but is a poor source of, the preventive for both blacktongue and pellagra.

The *soy bean*, contains the blacktongue preventive, but in relatively small amount, appreciably more, however, than the cowpea, but considerably less than the extracted wheat germ. So far as it goes, the experience with the soy bean in the human disease is, at least, not inconsistent with that in the experimental disease of the dog.

Milk contains the preventive for both the human and the canine disease, but contains it in relatively small amount.

Butter, while not devoid of it, is relatively a very poor source of the blacktongue preventive, a conclusion that is in harmony with the experience with butter in pellagra.

Cod-liver oil would seem very poor in or lacking the preventive for both blacktongue and pellagra.

Cottonseed oil contains little, if any, of the preventive for blacktongue. No specific study of the effectiveness of this oil in pellagra has been made; on the basis of general experience it seems unlikely that this oil contains the pellagra preventive in significant amounts.

Beef muscle is a good source of the preventive for both blacktongue and pellagra.

Pork liver is a good source of the blacktongue preventive; it has not yet been studied in pellagra.

Canned salmon contains the blacktongue preventive. A study of its effectiveness in pellagra is in progress.

Egg yolk contains the blacktongue preventive; a specific study of its value in pellagra has not yet been undertaken.

The *canned tomato* contains the preventive for both blacktongue and pellagra, but in relatively small amount.

The *carrot* contains, but is a relatively poor source of, the preventive of blacktongue. Its reported failure in pellagra prevention is consistent with the indications of its feebleness as a blacktongue preventive.

The *rutabaga turnip* contains, but is a relatively poor source of, the blacktongue preventive. Its failure in pellagra prevention is consistent with its poverty in the blacktongue preventive.

So far as they have been studied, the foodstuffs that appear to be good sources of the blacktongue preventive also appear to be good sources of the pellagra preventive; those that appear to be poor sources of, or lacking in, the blacktongue preventive likewise appear to be poor sources of, or lacking in, the pellagra preventive.

Considering the available evidence as a whole, it would seem highly probable, if not certain, that experimental blacktongue and pellagra are essentially identical conditions and thus that the preventive of blacktongue is identical with the pellagra preventive, or factor P-P.

On the basis of the indications afforded by the test in the dog, liver, salmon, and egg yolk are recommended for use in the treatment and prevention of pellagra in the human.

S. S.

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ing, Manufacturing, Distributing, Educational,
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ARMY VETERINARY SERVICE

CHANGES RELATIVE TO VETERINARY OFFICERS

Major Christian W. Greenlee is relieved from his present assignment as student at the Army Veterinary School, and directed to sail on or about Sept. 5, 1928, for the Philippine Department for duty.

Each of the following named officers is assigned to station indicated after his name, upon completion of his present tour of foreign service in the Philippine Department.

Lt. Colonel Burt English — to Fort Sill, Okla.
Major D. B. Leininger — to Fort Bliss, Tex.

Lt. Col. James R. Shand is relieved from duty at Fort Sill, Okla., and directed to proceed on or about Sept. 28, 1928, for the Philippine Dept. for duty.

Capt. Edward M. Curley is relieved from further assignment at Cornell University, and directed to proceed to Carlisle Barracks, Pa., for temporary duty for a period of approximately four months, and upon completion of this temporary duty to report to Brooklyn, New York, N.Y.G.I.D., for duty.

Capt. Geo. L. Caldwell is relieved from further assignment at the Cavalry School, Fort Riley, Ks., upon completion of his present course of instruction, and will report to the Commandant, Army Veterinary School, Army Medical Center, Washington, D. C. for duty.

Each of the following named officers is assigned to duty at the Army Veterinary School, Washington, D. C., for the purpose of pursuing a course of instruction, being relieved from his present assignment and duties in time to proceed to San Francisco, Calif., to sail on transport scheduled to leave that port on or about August 19, 1928, for New York City:

Captain Fred C. Waters — Camp S. D. Little, Ariz.
Captain Philip H. Riedel — Fort Bliss, Texas.

Reserve Corps

New Acceptances

Barthelme, L. F.....	2nd Lt....	1815 Washington Ave., Parson, Ks.
Bruns, Van Leslie.....	2nd Lt....	Lake City, Fla.
Carlisle, Wm. M. C.....	2nd Lt....	Hickory, Pa.
Elliott, C. H.....	2nd Lt....	Yorkville, Ill.
Grace, Reginald L.....	2nd Lt....	Box 267, Norwich, N.Y.
Carroll, F. E.....	2nd Lt....	Fredericktown, Mo.
Dunlap, Glen L.....	2nd Lt....	1126 Bluemont St., Manhattan, Ks.
Ehlers, Daniel P.....	2nd Lt....	3927 So. 24th Street, Omaha, Neb.
Elsea, Robert L.....	2nd Lt....	Sweet Springs, Mo.
Lauts, Albert E.....	2nd Lt....	Spencer, Neb.
McInay, John N.....	2nd Lt....	1126 Bluemont St., Manhattan, Ks.
Newlin, Theo. A.....	2nd Lt....	Lewis, Kansas.
Rose, V. T.....	2nd Lt....	Ionia, Kansas.
Schmidt, Albert I.....	2nd Lt....	37th & Leavenworth Rd., Kansas City, Ks.
Smith, L. H.....	2nd Lt....	Lebo, Kansas.
Shoeman, John D.....	2nd Lt....	Waukee, Iowa.
Spurlock, J. H.....	2nd Lt....	RFD No. 6, Osage City, Ks.
Andrews, Wm.....	2nd Lt....	7 S. 9th St., Marshalltown, Ia.
Collins, Clay R.....	2nd Lt....	Tilden, Nebr.
Criley, Ben R.....	2nd Lt....	Ottumwa, Ia.
Glascok, D. Wm.....	2nd Lt....	Audubon, Iowa.
McNellis, R.....	2nd Lt....	Dunkerton, Iowa.
Mayfield, O. J.....	2nd Lt....	Parnell, Mo.
Hilbert, K. F.....	2nd Lt....	Candor, N. Y.
Hopson, Geo. H.....	2nd Lt....	131 Center St., Massena, N. Y.

Kelly, W. A. 2nd Lt. . . . Lysander, N. Y.
 MacKeller, R. S., Jr. . . . 2nd Lt. . . . 39 Charles St., New York, N. Y.
 Poley, Philip. 2nd Lt. . . . 1225 Seneca Ave., Bronx, N. Y.

Promotions

Shigley, James Fremont. . 1st Lt. . . 118 S. Sparks St., State College, Pa.
 Harrison, Richard H., Jr. Capt. . . 806 N. Haskell St., Dallas, Tex.
 Pyle, Norman J. Capt. . . . Amherst, Mass.

Separations

Scanlan, Wm. J. 1st Lt. . . . ORC status terminated 2-24-28
 Bogue, Joseph A. 2nd Lt. . . . Failed to accept reappointment.
 Kirkwood, Glenn B. . . . 2nd Lt. . . . Failed to accept reappointment.
 Sailor, Ernest S. 2nd Lt. . . . Failed to accept reappointment.
 Baker, Bennie J. 2nd Lt. . . . Failed to accept reappointment.
 Driver, Fred C. 1st Lt. . . . Declined reappointment 6-4-28
 Lumby, Charles L. 2nd Lt. . . . Died 3-9-27
 Sears, Kirtley. 1st Lt. . . . ORC status terminated 3-31-28

Minneapolis, the Land of Hiawatha

ANIMALS' HEALTH A HUMAN CONCERN

The problem of keeping animals healthy is one of great importance to the health and wealth of human beings. It is not merely a question of kindness to animals, though on this account alone it would deserve attention.

Many of the diseases that afflict the animal world are communicable to man. Transmission may take place from contact, or from the use of diseased animals as food.

The individual who is expected to preserve the health of animals and to guard humans from the dangers which menace them when animals are sick, is the veterinarian. The importance of this medical authority is usually much underrated. He must be a person of intelligence and of integrity. Will Rogers has pointed out that the highest type of diagnosis has to be done by the veterinarian, since his patients are unable to tell what ails them.

An index to the slight estimate put upon the work of the veterinarian is contained in the fact that young men are not coming forward in sufficient numbers to take the places of the older men who drop out. If this suggests that veterinarians are underpaid, this in turn simply means that too little value is put upon their services.

Typhoid, tuberculosis, rabies, foot-and-mouth disease and a score of other ills would spread through our communities much more rapidly and destructively than they do now, if veterinarians were not alert to protect the public. Let us appraise their work at its full worth, and encourage more of our young men to enter this essential field of endeavor.

—*Boston Traveler.*

COMMENCEMENTS

UNIVERSITY OF GEORGIA

The commencement exercises of the University of Georgia were held June 20, 1928. The following graduates in the Division of Veterinary Medicine received the degree of Doctor of Veterinary Medicine:

Troy Benton Cobb
Oswald Lamont Osteen
Andrew Jackson Osteen
James Luther Smalley
Percy Marvin Spiers

Dr. Spiers was granted his degree at the end of the fall term.

Minneapolis, the Land of Hiawatha

MICHIGAN STATE COLLEGE

At the commencement exercises of the Michigan State College, held recently, the following graduates in the Division of Veterinary Science received the degree of Doctor of Veterinary Medicine:

Harry P. Cole
Sidney A. Wells
Clyde E. Dutton

The senior prize offered by the Michigan State Veterinary Medical Association was divided between Drs. Cole and Wells.

Minneapolis, City of Lakes and Gardens

PUBLICATIONS RECEIVED

- Soviet Union, Economic Statistics of the. Amtorg Trading Corporation, 165 Broadway, New York. March, 1928. pp. 78.
- Preliminary Report on the Experiment of the Aerobic Culture of Blackleg Bacillus and Its Protective Value. T. Takasawa. The Serum Institute of the Domestic Animal Disease, Taihoku, Formosa, Japan, 1927. pp. 28.
- A Treatise on Thuja and Colocynth. John Thomas Lloyd. Lloyd Bros., Pharmacists, Inc., Cincinnati, Ohio. pp. 28.
- Immunity or Resistance of the Chicken to Coccidial Infection. W. T. Johnson. (Sta. Bul. 230, Ore. Agr. Col. Exp. Sta., Corvallis, Ore., October, 1927. pp. 31.)
- New York State Association of Dairy and Milk Inspectors, First Annual Report of. Albany, N. Y., 1927. pp. 72.
- New York Women's League for Animals, Annual Report for 1927. New York, N. Y., 1927. pp. 94. Illustrated.

ASSOCIATION MEETINGS

CALIFORNIA STATE VETERINARY MEDICAL ASSOCIATION

The annual meeting of the California State Veterinary Medical Association was held at San Diego, June 11-13, 1928. Dr. J. P. Iverson occupied the chair and called the first session to order at 9:50 a.m. Dr. Iverson introduced Mayor Harry E. Clark, of San Diego, who gave a brief address of welcome. Dr. J. L. Tyler responded. The President's address was then delivered by Dr. Iverson.

The literary program was opened with the reading of a paper, entitled, "Facts, Figures and Statistics on the Operation of the Largest Hog Ranch in the world," by Dr. P. C. Guyselman, of Fontana. Dr. Guyselman gave a history of the Fontana Ranch Company, telling how the company took a contract with the City of Los Angeles for garbage delivered on railroad cars at Los Angeles for sixty cents per ton. The hog ranch occupies 240 acres and from 45,000 to 48,000 hogs are on feed at all times. The hogs are usually slaughtered at from eight to ten months of age, at which time they weigh approximately 200 pounds. Dr. Guyselman stated that the mortality at the ranch was about 10 per cent.

Dr. H. W. Graybill, of the California State Department of Agriculture, was the next speaker and presented a paper, entitled, "Activity of the Poultry Pathological Laboratory of Southern California." Dr. Graybill told of the importance of poultry work and advised veterinarians to study poultry diseases as much as possible. Dr. Graybill stated that during the two years that the laboratory has been in existence, fifty-one diseases, or conditions, have been observed and studied. The following were mentioned in the order in which they are most frequently found at the laboratory: coccidiosis, bacillary white diarrhea; mismanagement, including improper feeding, breeding, etc.; roundworms; cecum worms; tumors; paralysis; chicken pox; ruptured yolks; poisoning; fowl typhoid and fowl cholera. Dr. Graybill stated that no tuberculosis had been observed at the laboratory.

Monday afternoon was devoted to a sight-seeing trip. Members of the Association, wives and friends left San Diego shortly

after one o'clock, traveling southward by automobile across the Mexican border to Tia Juana. Tia Juana has proven to be a very famous resort since the adoption of the Eighteenth Amendment to our national Constitution became effective. Our first stop in old Mexico was at Baron Long's new hotel, which is not yet completed. This hotel contains a bar of very promising appearance, but as the hotel is still under construction nothing was being served and it was not long before some of the boys began singing, "How Dry I Am." Our next stop found the entire party seated in one of Tia Juana's most famous resorts where ample refreshment was secured. This apparently was enjoyed by all. The next stop was at the Foreign Club, a famous gambling place, where roulette wheels, "galloping dominoes," and many other gambling games were being operated. These games were played at tables stacked high along the edges with gold and silver money and many of our party tried their luck for a few minutes. Contrary to reports received from many sources, the entire party returned to San Diego in good condition, arriving about six o'clock. All agreed that the trip to old Mexico was a great success.

The business session of the meeting was held Monday evening, at which time regular routine business was conducted and the annual election of officers was held. This resulted as follows: President, Dr. E. H. Barger, Berkeley; vice-president, Dr. W. L. Edwards, Visalia; treasurer, Dr. D. F. Fox, Sacramento; secretary, Dr. W. L. Curtis, Los Angeles.

The annual report of the Secretary showed that there were 288 members, four of whom were dropped during the meeting and eleven new members admitted, bringing the total up to 295 at the time of adjournment. The annual report of the Treasurer showed a balance of \$1,372.45.

The Tuesday morning program was opened by Dr. A. G. Boyd, of San Diego, who read a paper, entitled, "Observations on Diseases of Captive Wild Animals." Dr. Boyd's paper brought out the fact that gastro-intestinal conditions, internal and external parasites, over-feeding by visitors, tuberculosis in monkeys, distemper in foxes and stomach ulcers in seals were all seen frequently at the zoo in San Diego. Dr. Boyd also mentioned the importance of testing horses for glanders in cases where horse meat is fed raw to wild animals.

Dr. K. G. McKay, of the Los Angeles County Live Stock Inspector's Office, presented a paper, "Atypical Reactors to the

Tuberculin Test." A very attractive feature in connection with Dr. McKay's paper was the exhibition of several models or moulds made to illustrate different reactions that are found in making intradermal tests for tuberculosis. Dr. Haring moved that the Association finance an exhibit of these moulds or models, to be shown at the A.V.M.A. meeting and some member of the Association, who was planning to attend the meeting, be delegated to demonstrate them. Motion was seconded and carried. It was agreed by all present that these moulds or models constituted one of the best demonstrations that have ever been given before the Association. Dr. C. M. Haring, of the University of California, presented a paper, entitled, "Accredited Abortion-free Herds." He outlined plans for the control of abortion and stated that the agglutination test for abortion is satisfactory.

Dr. A. P. Immenschuh, of San Diego, read a paper, "Use of Live Organisms in Control of Infectious Abortion at the San Diego County Farm." Dr. Immenschuh related his experience with abortion at the County Farm.

Dr. J. M. Arburua, of San Francisco, opened the afternoon program with the reading of a paper that had been prepared by Dr. H. B. F. Jervis, of Beverly Hills, on the subject of "Non-infectious Skin Diseases of the Dog." Owing to the absence of the author there was no discussion.

Dr. T. H. Agnew, of Pasadena, read a paper, "Canine Typhus." This paper and the discussion that followed brought out the following treatment for canine typhus. Use gastro-intestinal lavage, containing Epsom salt, sodium chlorid and bicarbonate of soda. Orally administer butter, cream or raw liver.

Dr. C. H. Zink, of Los Angeles, spoke on "Anaplasmosis." Dr. Zink told how the disease had been found in Los Angeles County. Dr. Karl F. Meyer, of San Francisco, opened the discussion. He spoke at considerable length on the disease. His description contained the very latest information regarding anaplasmosis. Dr. Meyer also spoke on canine typhus, stating that it was his belief that the condition is a deficiency disease.

Dr. J. M. Arburua presented a paper, entitled, "The Relation of the S.P.C.A. to the Practicing Veterinarian." Dr. Arburua's paper indicated that in certain localities S.P.C.A. hospitals are becoming a serious menace to the local practicing veterinarians. It was decided that one veterinarian from San Francisco, or vicinity, who is familiar with the conditions there, be added to the Resolution Committee and that a resolution be drawn to be

presented to the A.V.M.A. at Minneapolis, covering the S.P.C.A. hospital question.

A banquet was held at the Mission Beach Casino, Tuesday evening. Including the ladies, there were 120 in attendance. Entertainment and music for dancing were provided.

Wednesday morning, Dr. E. C. Jones, of Hollywood, presented a paper, entitled, "Advantages of a Diagnostic Laboratory in Connection with Small Animal Hospitals." Dr. Jones urged that all known methods be used in attempting to make correct diagnoses.

Dr. J. L. Tyler, of Pomona, presented a paper, entitled, "History of the Veterinary Profession of California." This paper was very interesting and in several places quite humorous. Many good laughs were indulged in while the paper was being read.

Dr. H. J. Achard, of Glendale, presented a paper, entitled, "The Endocrines in Pathogenesis and Therapy." Dr. Achard stated that eclampsia may be caused by improper activity of the liver and he suggested liver preparations and a liver diet as possible preventives. Dr. Achard also stated that eczema may be due to a thyroid deficiency and suggested that thyroid extract be tried in cases of eczema. He mentioned that placenta preparations will increase the secretion of milk.

The final paper on the literary program was presented by Dr. F. W. Wood, of Berkeley, entitled, "Observations on Canine Distemper." Dr. Wood mentioned the various biological preparations that are being used in the treatment of canine distemper and stated that some cases of intestinal distemper will sometimes recover rapidly, following the use of calf scour serum.

It was voted to hold the 1929 annual meeting at Sequoia National Park.

Wednesday afternoon was set aside for a visit to Balboa Park, where there is a zoo containing nearly 1700 animals, including birds.

W. L. CURTIS, *Secretary.*

STATE VETERINARY MEDICAL ASSOCIATION OF TEXAS

The eighteenth annual meeting of the State Veterinary Medical Association of Texas was held at College Station, June 18-22, 1928. In connection with the usual postgraduate work

given to the members of the Association by the faculty, practicing veterinarians of the State and outstanding lecturers were secured by the College to help with the program.

Dr. Mark Francis, dean of Veterinary Science, assured the visiting parties of their welcome and expressed confidence in the work being done in Texas today and his great pleasure at the good attendance.

Dr. R. P. Marsteller, the untiring genius of the College who makes the wheels turn and who makes everybody comfortable and happy, conducted a clinic the afternoon of the first day, on diseases and surgery of horses and mules. His work on epidural anesthesia, sterility, caudal myotomy, wound treatment, roaring, lameness and periodic ophthalmia is notable and his clinic was history-making. Dr. W. R. Sanderson, of Brownwood, spoke on salivary calculi.

The outstanding lecturer of the course was Dr. J. F. DeVine, of Goshen, N. Y., who lectured on diseases of the reproductive organs of cattle, diseases of the digestive organs and diseases of cattle and young cattle. He also held a clinic on diseases and surgery of cattle, diagnosis of pregnancy and treatment of sterility. Dr. DeVine proved to his delighted hearers that he has a proper fundamental knowledge of his work and was also a careful diagnostician, as well as giving careful directions as to treatment.

A very enjoyable program was carried out Tuesday evening, in joint session with the Ladies' Auxiliary. Dr. T. O. Walton being absent, Dr. R. P. Marsteller gave a gracious address of welcome. Dr. A. E. Flowers, of Dallas, responded with his usual fund of facts and information on practical lines, with the lighter vein interspersed throughout.

A paper by Mrs. U. E. Marney, of San Antonio, president of the Ladies' Auxiliary, drew much applause and favorable comment. Mrs. Marney showed by the able way in which she handled her subject that the women of the profession are alive to their responsibilities. Dr. M. E. Maier, of Orange, retiring president of the Association, gave an interesting talk and expressed much appreciation for the cooperation he had received from the members of the Association.

Mrs. R. P. Marsteller, loan fund secretary of the Women's Auxiliary to the A.V.M.A., gave a report of the meeting held in Philadelphia, in 1927. A humorous paper, called, "News of the Season," was read by Mrs. W. R. Sanderson, of Brownwood,

and was greatly enjoyed. The quips and quirks at the men caused even Dr. John Gillman to retire. Dr. DeVine closed the program with a speech to the ladies that was much applauded.

New officers of the Ladies' Auxiliary were elected as follows: President, Mrs. U. E. Marney, San Antonio; first vice-president, Mrs. R. P. Marsteller, College Station; second vice-president, Mrs. C. R. Covington, San Antonio; corresponding secretary, Mrs. W. R. Sanderson, Brownwood; secretary-treasurer, Mrs. D. Pearce, Leonard.

Dr. A. E. Wharton, of the college staff, spoke on "The Veterinarian in Public Health." Dr. Thomas O'Reilly, of the Federal Bureau of Animal Industry, Fort Worth, discussed "The Administration of Intradermic Tuberculin and the Interpretation of Reactions."

Dr. T. O. Booth, Laboratory Director, Live Stock Sanitary Commission of Texas, told of the Texas plan for eradicating contagious abortion. Dr. A. A. Lenert, of the college staff, talked on symptoms of fright disease in dogs, typhus of dogs, and diseases and surgery of small animals. He also covered anthelmintics for small animals. Dr. V. A. Scott, of the John Tarleton Agricultural College, Stephenville, gave some case reports.

"What Tick Eradication Means to the Live Stock Industry and the Veterinarian" was discussed by Dr. H. L. Darby, of the Federal Bureau of Animal Industry, Fort Worth.

Thursday afternoon, Dr. R. C. Dunn, of the college staff, held a clinic on poultry diseases, including contagious epithelioma, bacillary white diarrhea, fowl typhoid, internal parasites, coccidiosis, botulism, fowl paralysis, caponizing, collecting blood for serological tests, methods of administering medicines to poultry and postmortem technic.

Dr. J. D. Jones, of the Texas Experiment Station, and Dr. H. O. Von Rosenberg, of the Live Stock Sanitary Commission of Texas, held a clinic on diseases and surgery of sheep and goats. The Association regrets very much to learn that Dr. Jones will soon leave the College. They feel that his going will be a great loss to the State as well as to the College.

Dr. W. M. Smotherman, veterinarian to the Penitentiary System, Huntsville, demonstrated the use of the emasculatome.

Other phases of the meeting were the advantages that the veterinarians had for consulting members of the faculty, as well as Dr. DeVine, on special lines of work. The course was voted more than good. The practicing veterinarians of the State

were called on and responded ably and gave valuable demonstrations. The program was largely in their hands and much credit is due them.

At the business session, the following officers were elected: President, Dr. M. E. Gleason, San Antonio; first vice-president, Dr. Y. J. Aiken, Lubbock; second-vice-president, Dr. W. R. Hodges, Ranger; secretary treasurer, Dr. D. Pearce, Leonard.

D. PEARCE, *Secretary.*

***Minneapolis, the Gateway to the
Ten Thousand Lakes Region***

MISSOURI VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Missouri Veterinary Medical Association was held at Carthage, June 26-28, 1928. Headquarters were at the Drake Hotel. All sessions were held in the hotel except the clinic, which was held in the arena of a large sales barn a short distance from the hotel. More than 100 veterinarians from Missouri and neighboring states were in attendance.

The meeting was called to order by the President, Dr. F. C. Cater, of Sedalia, at 11:00 a. m. Mr. Allen McReynolds, of Carthage, delivered the address of welcome. Dr. H. A. Wilson, State Veterinarian, responded. A short business session followed the President's address.

Dr. J. L. Jones, of Blackburn, gave some very interesting case reports that brought out a good discussion.

The afternoon session opened with a talk by Dr. D. B. Morgan, of Neosho, one of the oldest veterinary practitioners in America. He gave a few "Pointers in Horse Practice" that had been gleaned from a wide experience throughout the world. "Sit Fasts or Sore Necks and Their Sequelae," by Dr. J. B. Rand, of Bunceton, brought out many practical points. Dr. Ashe Lockhart, of Kansas City, gave a good discourse on anaphalaxis, as observed in the field, following the use of various biologics.

Dr. C. R. Walter, of Tulsa, Okla., was a visitor and favored the Association with a practical discourse on "Parasites, Symptoms and Treatment in Dogs and Cats." Dr. Walter also conducted an interesting round-table discussion on small-animal practice. The subject of rabies was handled by Dr. C. E. Salsbery, of Kansas City. The rabies situation in this and other countries was stressed by the speaker.

For the evening, the local committee had arranged for the use of the Royal Theatre. The Association attended in a body and the entire community was invited to see two B. A. I. films: "T.B. or Not T.B.," dealing with avian tuberculosis and its control, and "This Little Pig Stayed Home," dealing with hog cholera control. Both films are good and encourage the use of veterinary service.

The local committee, headed by Dr. W. J. Houser, of Carthage, as chairman, assembled the most elaborate bunch of material for the clinic that has been seen at any meeting in recent years. The following will give an idea of its scope:

Equine clinic: Three ridgling horses were castrated; one horse operated on for fistula of the withers; one case of well-developed glanders in a mule was presented and the diagnosis confirmed by ophthalmic and intrapalpebral mallein tests; four other equines were presented for observation and diagnosis.

Bovine clinic: Enucleation of the eye from two cows; teat operations on four cows; one cow presented for observation and diagnosis.

Swine clinic: Two pigs operated upon for scrotal hernia; one hog operated upon for perineal hernia; one case of chronic rhinitis in the pig was presented.

Canine clinic: Twelve dogs affected with various ailments were presented. One very interesting operation for entropion was performed on a dog by Dr. L. G. Clark, of Los Angeles, Calif., who was a visitor in his old home state of Missouri.

Poultry clinic. In addition to the above, about twenty-five fowls with conditions commonly found in a country practice were submitted to autopsy. Postmortem was held on one sheep. Several animals were on the picket line for observation and examination, but were not reached due to a lack of time.

The annual banquet was served in the large hall of the Drake Hotel, with 135 veterinarians and friends in attendance. One of the appealing things about the banquet was the menu, which featured half a fried chicken with all the Ozark trimmings for the price of \$1.00. The principal talk of the evening was made by Dr. H. A. Wilson on the subject, "Tomorrow."

The program of the third day was opened with a business session. Twenty-five new members were added to the roll. Various committee reports were received and then the program was continued.

The committee in charge of the Missouri Veterinary Medical Association building, to be located in the State Fair Grounds, made a report to the effect that plans had been completed, contracts let and the work on the structure had been started. The building will be completed before the Fair this fall.

Dr. R. R. Gloyd, of Butler, gave an interesting discourse on "The Vicissitudes of Country Practice." Dr. J. H. Bux, state veterinarian of Arkansas, was a visitor and favored the Association with a paper, entitled, "Arkansas Animal Industry Problems."

The subject of "Farming and Beef Cattle" was handled in a unique manner by Mr. Franklin Greenwood, a dirt farmer, of Carthage. "What More Dairying in Missouri Means to the Veterinarian" was the subject of Mr. E. G. Bennett, dairy commissioner of Missouri.

Dr. Ashe Lockhart, of Kansas City, gave an extemporaneous talk on "Anaplasmosis." This disease appears to be widespread throughout the Southwest. Dr. R. C. Moore, of St. Joseph, made one of his very instructive talks on "Surgical Diseases of the Udder of Dairy Cows." A round-table discussion on "Problems in Dairy Practice" was conducted by Dr. J. L. Wells, of Blue Springs.

Officers for the coming year were elected as follows: President, Dr. J. L. Wells, Blue Springs; vice-president, Dr. W. J. Houser, Carthage; secretary-treasurer, Dr. J. D. Ray, Kansas City.

J. D. Ray, *Secretary*.

Minneapolis, the Metropolis of the Northwest

VERMONT VETERINARY ASSOCIATION

The twentieth annual meeting of the Vermont Veterinary Association was held at Burlington, July 10-11, 1928, with about twenty members present and visiting veterinarians from Vermont, New Hampshire and Massachusetts.

The meeting was called to order, at two o'clock, the first day, by President R. C. Goss, of Middlebury. Officers for the coming year were elected as follows: President, Dr. C. M. Miller, Orwell; vice-president, Dr. A. D. Spooner, Barre; secretary-treasurer, Dr. G. N. Welch, Northfield.

The Necrology Committee made a report of the death of one member, Dr. Herbert S. Perley, of Hanover, N. H., during the

year, and they paid a very touching tribute to this beloved member. Dr. Goss delivered a very able address upon retiring as president.

Papers were then read by Dr. C. M. Miller, of Orwell, on "Anesthesia and Necrosis." This paper was very instructive and interesting and brought out a good discussion. Dr. George Stephens, of White River Junction, presented a paper on "Professional Ethics in Practice." This created quite a heated discussion. Dr. F. A. Rich, of the Vermont Agricultural Experiment Station, Burlington, then gave a very able talk on "Udder Diseases." Special stress was placed on preventive measures.

Adjournment was then made to the Steamer "Ticonderoga," which left the wharf at 5:30. About fifty members and friends enjoyed the beauties of Lake Champlain and its sunset until 10:30 p.m. At six o'clock all repaired to the attractive dining-room of the boat and fully satisfied the inner man.

Wednesday morning, at nine o'clock, all took autos and went to Fort Ethan Allen, where Colonel F. A. Hopkins, Post Commander, met all with a hearty hand clasp and a few genial words of welcome. Capt. James E. Noonan, Post Veterinarian, then conducted the party through the stables to the Post Hospital, where short clinics were held and Capt. Noonan read a very interesting paper, entitled, "Veterinary Service of the Army."

Dr. W. R. Hinshaw, of the Massachusetts Agricultural College, Amherst, gave a short but spicy talk on "The Veterinarian and Poultry Diseases." Questions and discussion followed and a rising vote of thanks was given Capt. Noonan and Dr. Hinshaw for the hospitality of the post and the papers.

It was decided to hold the 1929 meeting in Montreal, in mid-summer. This was a very enjoyable and profitable meeting, thanks to Dr. and Mrs. J. A. Rust. Dr. Rust acted as chairman of the local Committee on Arrangements.

G. N. WELCH, *Secretary.*

Minneapolis, the Youngest City of Its Size in the World

KENTUCKY VETERINARY MEDICAL ASSOCIATION

The regular annual meeting of the Kentucky Veterinary Medical Association was held at Henderson, July 11-12, 1928, with headquarters at the Soaper Hotel. The address of welcome was delivered by Hon. M. D. Eblen, mayor of Henderson, and was responded to by Dr. A. S. Barnes, of Frankfort.

The presidential address was given by Dr. T. P. Polk, of Lexington, and Dr. C. G. Kreidler read the minutes of the previous meeting and rendered his report as secretary-treasurer.

The first paper on the program was presented by Dr. W. W. Dimock, of Lexington, entitled, "Eradication of Abortion." This subject was discussed by Dr. R. T. Jett, of Hopkinsville, and Dr. C. E. Palmer, of Shelbyville. The meeting adjourned for luncheon and the afternoon session commenced at 1:30 with Dr. F. H. Brown, state veterinarian of Indiana, as the first speaker, his subject being "Cooperation in Disease Control Work." A paper entitled, "Special Problems in Disease Control Work," was presented by Dr. D. E. Westmorland, state veterinarian of Kentucky, and the discussion opened by Dr. W. F. Biles, of Frankfort.

Dr. Benj. Schwartz, of the U. S. Bureau of Animal Industry, Washington, D. C., delivered a paper on "Gastro-Intestinal Parasites of Equines and Their Control," which was followed by a paper on "Hospitalization Methods for Both Medical and Surgical Cases," presented by Dr. J. H. Snook, of Ohio State University. This subject was discussed by Dr. E. Calldemeier, of Louisville; Dr. Harry Gieskemeyer, of Newport; and Dr. R. W. Youngblood, of Henderson. Dr. J. C. Melvin, of Mayfield, spoke on "The Importance and Reliability of the Agglutination Test for Bacillary White Diarrhea of Fowls."

The evening session opened with a moving picture showing the production of serum and virus. This was discussed by Dr. J. L. Kixmiller, of Indianapolis. A general discussion on hog cholera and swine diseases followed by Dr. W. M. Coffee, of La Center, and Dr. K. H. Beyer, of Henderson.

The second day, Dr. R. W. Youngblood conducted a clinic held at his hospital. A demonstration of pathological specimens was conducted by Dr. R. H. Nutt, of Henderson, and some special surgical methods were demonstrated by Dr. Snook, assisted by Dr. Beyer and Dr. Coffee.

The election of officers resulted as follows: President, Dr. A. J. Kay, Frankfort; first vice-president, Dr. C. E. Palmer, Shelbyville; second vice-president, Dr. F. H. Riester, Buechel; third vice-president, Dr. E. M. Stemmler, Lexington; secretary-treasurer, Dr. C. G. Kreidler, Maysville.

The next meeting will be held in connection with the Veterinarians' Conference at the Agricultural Experiment Station, Lexington, January, 1929.

A barbecue was held at Atkinson Park, at 1:30, after which the meeting adjourned.

C. G. KREIDLER, *Secretary*.

Minneapolis, America's Vacation City

PERSONALS

MARRIAGES

Dr. O. C. Lynch (Cin. '18), of Statesville, N. C., to Miss Grace Wilson, of Newton, N. C., June 20, 1928.

Dr. Harry B. Steinbach (U. P. '27), of Norristown, Pa., to Miss Rosalie Camilla Monshower, of Valley Forge, Pa., June 23, 1928, at Valley Forge.

Dr. A. E. Hilbert (Corn. '27) to Miss Ruth Carlton, June 28, 1928, at Danby, N. Y.

Dr. K. F. Hilbert (Corn. '28), of Farmingdale, N. Y., to Miss Evangeline Baylor, of Danby, N. Y., June 28, 1928, at Danby, N. Y.

Dr. A. W. Nyline (Iowa '25), of Hinkley, Minn., to Miss Sarah Ashley, of Clinton, Ill., July 2, 1928, at St. Paul, Minn.

Minneapolis, the 1928 Convention City

PERSONALS

Dr. Vernon B. Overman (Iowa '28) has located at Winchester, Ind.

Dr. John D. Shoeman (K. S. A. C. '28) has located at Bussey, Iowa.

Dr. R. L. Elsea (K. S. A. C. '28) has opened an office in La Monte, Mo.

Dr. S. H. Hopson (Corn. '28) has located for practice at Massena, N. Y.

Dr. J. P. McIntosh (Corn. '28) has selected Dolgeville, N. Y. for a location.

Dr. Alan Bachrach (U. P. '28) is located at 5449 N. 11th St., Philadelphia, Pa.

Dr. G. J. Goubeaud (Corn. '28) has gone into private practice at Flushing, N. Y.

Dr. Bert J. Cady (Corn. '04) has removed from Delmar, N. Y., to Voorheesville, N. Y.

Dr. B. A. Zupp (Iowa '23) has removed from Blue Earth, Minn., to Waltham, Minn.

Dr. V. H. Miller (O. S. U. '24), formerly located in Toledo, Ohio, is now at Marengo, Iowa.

Dr. C. J. Noonan (Corn. '28) is associated with Drs. Miller and Zepp, of New York City.

Dr. Roy L. McConnell (K. S. A. C. '28) has located at 714 West 8th St., Coffeyville, Kans.

Dr. Vilo T. Rose (K. S. A. C. '28) has selected Elkton, Ky., as a suitable location for practice.

Dr. Lloyd Darst (Iowa '28) has accepted a position with the Peoria Veterinary Hospital, Peoria, Ill.

Dr. W. A. Kelly (Corn. '28) has accepted a position at the North Shore Animal Hospital, Evanston, Ill.

Dr. K. F. Hilbert (Corn. '28) is located at the State Institute of Applied Agriculture, Farmingdale, N. Y.

Dr. R. V. Westerberg (Ont. '27), formerly of Simsbury, Conn., is now practicing in New Britain, Conn.

Dr. S. H. Exley (Ga. '24), formerly of Cleveland, Tenn., has selected Lebanon, Tenn., as a better location.

Dr. L. W. Messer (Corn. '28) has accepted a position at the Hinckley Veterinary Hospital, Buffalo, N. Y.

Dr. H. P. Cole (Mich. '28) has opened a small-animal hospital in Saginaw, Mich. His address is 1518 N. Michigan Ave.

Dr. M. C. Hawn (Iowa '27) formerly of Johnson, Nebr., is now located in Madison, Wis. Address: 1113 West Johnson.

Dr. W. E. Ulmer (Corn. '28) is with the New York Women's League of America, 350 Lafayette St., New York, N. Y.

Dr. Chauncey D. Maulfair (Chi. '02) has resumed practice at Granville, Ill., after having been disabled for the past few years.

Dr. T. B. Burris (O. S. U. '24), formerly of Los Angeles, Calif., is now in practice in Bridgeport, Conn. His address is 336 State St.

Dr. Carl L. Martin (O. S. U. '28) has located in Southbridge, Mass., where he has taken over the practice of the late Dr. William T. Pugh.

Dr. G. M. Jones (K. C. V. C. '13) is in charge of the Tex Austin ranch at Rowe, N. Mex. Dr. Jones was formerly located in Las Vegas, N. Mex.

Dr. R. E. Nichols (Corn. '28) has accepted an appointment in the Small Animal Clinic, New York State Veterinary College at Cornell University.

Dr. Thomas H. Edwards (K. C. V. C. '09), formerly located in Pasadena, Calif., has removed to Los Angeles, Calif. Address: 5217 Huntington Drive, N

Dr. G. O. Smith (McK. '08) has been re-appointed Woodford County (Ill.) Veterinarian. This action was taken at a special meeting of the County Board recently.

Dr. C. L. Woolard (Chi. '17), of Benton, Ill., has been appointed Montgomery County (Ill.) Veterinarian by the Board of Supervisors, at a salary of \$3600 per year.

Dr. Charles J. Parshall (Corn. '28) has accepted an appointment at the North Dakota Agricultural College, Fargo, where he will engage in teaching and research work.

Dr. J. E. Pyle (Chi. '07), of Toulon, Ill., recently received an appointment in the Illinois State Department of Agriculture. He will be engaged in tuberculosis eradication work.

Dr. L. H. LaFond (Mich. '23), formerly of Flint, Mich., has removed to Detroit, Mich. He announced the opening of the LaFond Veterinary Hospital, 3191 W. 8-Mile Road, on June 25.

Dr. G. W. Hess (Chi. '07) recently resigned his position as Montgomery County (Ill.) Veterinarian, to accept a similar position in McHenry County (Ill.). Dr. Hess will be located at Woodstock, Ill.

Dr. E. D. Modlin (Ind. '15), of Cambridge City, Ind., was able to resume his practice recently, following a period of enforced idleness after undergoing an operation at the U. S. Naval Hospital, in Chicago.

Dr. J. F. Gillespie (Ont. '96), of Tuscola, Ill., sustained painful injuries in a collision between an interurban car, on which he was riding, and an automobile, driven by a drunken driver, in Danville, Ill., recently.

Dr. H. M. Williams (K. C. V. C. '11) has resigned his position with the Bureau of Animal Industry and has located for practice at Ferndale, Wash. Dr. Williams took his state board examination at Pullman, June 12 and 13.

Dr. I. D. Wilson (Iowa '14), of the Virginia Polytechnic Institute, Blacksburg, Va., has been spending the summer in the Department of Zoology and Entomology at Iowa State College, taking postgraduate work in protozoology.

Dr. W. E. Russel (Chi. '20), of North East, Pa., read a paper on "The Breeding Problems of the Silver Black Fox," at the summer meetings of the American Fox Institute, held last month at Denver, Colo., and also at Salt Lake City, Utah.

Dr. H. Van Roekel (Iowa '25) has accepted a position with the Fish and Game Commission of California. He is now engaged in research work with diseases of fish and wild game, at the George Williams Hooper Foundation for Medical Research, at San Francisco.

Dr. Lewis H. Moe (O. S. U. '27), who has been at the Ohio State University the past year, has accepted an appointment as assistant professor in the Department of Bacteriology and Veterinary Medicine of the Oklahoma A. & M. College, at Stillwater. Dr. Moe plans to attend the meeting in Minneapolis on his way west.

Dr. B. L. Strohl (Ind. '08) has been appointed Edgar County (Ill.) Veterinarian for the coming year. The past year Dr. Strohl had two counties in his charge, Edgar and Coles, but, having found it impossible to cover two counties efficiently, he will have only Edgar County the coming year. Another veterinarian will be appointed for Coles County.

Dr. L. J. Proper (Chi. '05), of San Diego, Calif., has leased his small animal hospital to Dr. F. J. Bolander (U. S. C. V. S. '14). Dr. Proper still retains his position as City Milk Inspector of San Diego. Dr. Bolander subsequently turned the hospital and practice over to Dr. H. L. Simpson (McK. '12), Dr. Bolander going to Los Angeles to accept a position with the California Department of Agriculture.

Minneapolis, the Financial, Wholesaling, Jobbing, Retailing, Manufacturing, Distributing, Educational, Cultural Metropolis of the Northwest

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September, 1928

No. 5

MINNEAPOLIS BREAKS RECORD

The 1928 meeting of the American Veterinary Medical Association, held in Minneapolis, is now a part of veterinary history in this country. As generally predicted, the convention broke all records for attendance. Dr. J. P. Foster, chairman of the Subcommittee on Registration, reported that over 1400 registered during the week and it will be surprising if the final check-up does not show close to 1500, or even more. In addition to establishing a new attendance figure, Minneapolis won other laurels. The entertainment provided for the ladies, the appointments for the meeting, the banquet and the clinic all set new marks for future convention cities to "shoot at."

The members of the Local Committee on Arrangements were the recipients of showers of well-deserved praise. The chairmen and members of all subcommittees were "on their toes" the whole week and the carefully laid plans of the past year came to full fruition with clock-like precision. Those who have never had the pleasure of planning the details of an A. V. M. A. convention cannot appreciate how much hard work is essential for the success of one of our annual conclaves. Those who have been on the inside can readily do so.

The official program was followed with practically no deviation. Honorable Theodore Christianson, governor of Minnesota, was there in person and delivered a stirring address of welcome.

His statement that he was heartily in favor of continuing the work of eradicating tuberculosis from the cattle of Minnesota was received with a great outburst of applause. The address of President Hilty, published in this issue of the JOURNAL, recounted the accomplishments of the past year and contained a number of recommendations to the Association. In order to appreciate this address it should be read in full.

The Executive Board reported the completion of the big job of studying a long list of proposed changes in the Constitution and By-Laws. These were taken up and disposed of at the business session Tuesday afternoon. This was accomplished without



THE A. V. M. A. CLINIC AT UNIVERSITY FARM
Dr. C. P. Fitch in the role of anesthetist.

any serious objections being offered to the recommendations of the Executive Board. It was agreed that the amendments adopted should not go into effect until the close of the meeting. Accordingly, the election of officers, Wednesday afternoon, was held under the old plan and no opportunity was offered to study the new plan in actual operation.

The report of the Secretary-Editor showed a healthy increase in membership over the preceding year. The number of applications for membership (almost 400) filed during the year was

the largest for some time. The Association lost thirty-eight members by death since the 1927 meeting. The report stated that the dues of more members were paid right up to date than at any time during the past five years. It had been necessary to drop considerably less than the usual number for the non-payment of dues the past year, and the list of resignations was the shortest for some time. The new members added September 1 boost the membership over the 3800 mark and the applications now on file, when completed, will increase the number well over the 3900 mark.

That part of the report dealing with the JOURNAL was equally gratifying. It was stated that the July issue of the JOURNAL contained more paid advertising than any other issue during the past five years and the circulation for the current month was also at the highest point reached during this period.

The financial statement of Treasurer Jacob, covering the first seven months of the year 1928, showed a shrinkage in the cash resources of about \$2,000. This was largely the result of the rather heavy expenditures upon the part of the Committee on Legislation, in connection with the fight to secure better compensation for veterinarians in the B. A. I. service. Other expenses of the Association have been increasing right along, keeping pace with the expanding activities of the organization.

Dr. T. E. Munce, of Harrisburg, Pa., director of the Pennsylvania Bureau of Animal Industry, was the unanimous choice for President. More will be said of Dr. Munce elsewhere. Vice-presidents were elected as follows:

First Vice-President, Dr. Seymour Hadwen, Saskatoon, Sask.

Second Vice-President, Dr. W. A. Axby, Harrison, Ohio.

Third Vice-President, Dr. O. M. Norton, Greenville, Miss.

Fourth Vice-President, Lt. Col. Robt. C. Musser, V. C., U. S. Army.

Fifth Vice-President, Dr. W. G. Hollingworth, Utica, N. Y.

Dr. M. Jacob, of Knoxville, Tenn., was unanimously elected Treasurer for his eleventh consecutive term, beginning January 1, 1929.

In the four sections officers were elected as follows:

Section on General Practice

Chairman—Dr. W. M. Bell, Nashville, Tenn.

Secretary—Dr. E. P. Althouse, Sunbury, Pa.

Section on Sanitary Science and Food Hygiene

Chairman—Major R. A. Kelser, Washington, D. C.

Secretary—Dr. F. H. Brown, Indianapolis, Ind.

Section on Education and Research

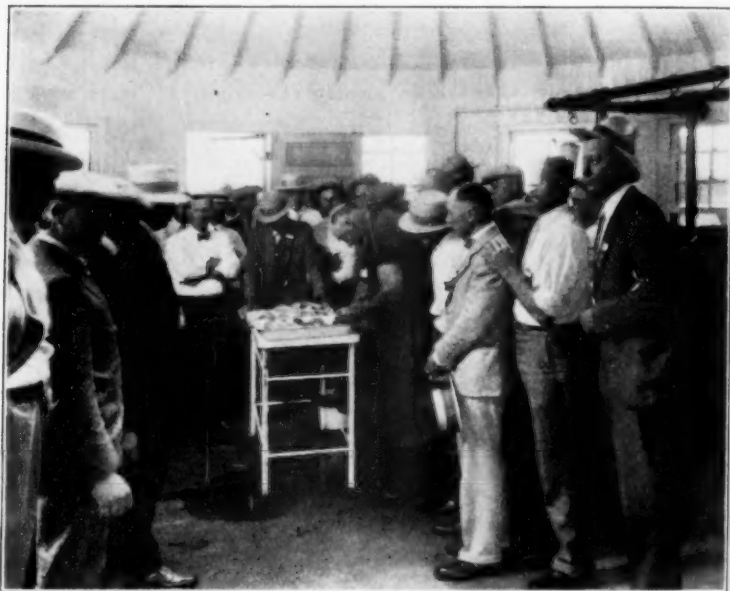
Chairman—Dr. H. E. Biester, Ames, Iowa.

Secretary—Dr. W. A. Hagan, Ithaca, N. Y.

Section on Small Animals

Chairman—Dr. Cbas. W. Bower, Topeka, Kans.

Secretary—Dr. H. J. Milks, Ithaca, N. Y.



THE A. V. M. A. CLINIC AT UNIVERSITY FARM
Dr. C. H. Case, of Akron, Ohio, demonstrating diagnosis and treatment of sterility.

Detroit, Michigan, was selected as the 1929 convention city. Washington, D. C., was the only other contender, in spite of the fact that half a dozen cities had earlier indicated a desire to have the next meeting. Los Angeles and Kansas City put in bids for the 1930 convention.

An unusually large number of meetings of college alumni associations were held Tuesday evening. It is hoped that we will be able to publish a brief report of every one of these meetings. The President's reception and dance followed and proved to be a very enjoyable occasion in spite of the warm weather.

All committee reports were on hand when called for. These will be published in full in the proceedings in the next issue of the JOURNAL and for that reason only very brief comments will be made at this time. The report of the Committee on Legislation, among other things, stated that the efforts put forth to prevent an increase in the amount of the narcotic license fee to be paid by veterinarians had been successful. This really means that the efforts of this committee resulted in a saving of \$2.00 per year to every veterinarian in the United States who takes out a permit to use narcotics.

The Committee on Intelligence and Education recommended that no change be made in the name "veterinarian." A report of progress was made in the work of studying the courses of study in veterinary subjects being offered by the various agricultural colleges. The Committee on Veterinary Biologies made notable progress during the year and has already classified a number of veterinary biologies now in common use. The Committee on Schmidt Memorial reported that the work of raising funds for a memorial to Dr. Schmidt had been completed and the memorial had been dedicated with appropriate ceremonies. A member of the committee, Dr. H. Jensen, of Kansas City, was present when the dedication was made, as the official representative of the A. V. M. A.

One of the most important committee reports made at the meeting was that of the Committee on Proprietary Pharmaceuticals. It seemed to be the consensus of opinion of a great many members that this new activity of the A. V. M. A. was one of the most important to be taken up during recent years. It would be well for every member of the Association to study this report, with the discussion which followed, when it is published in the official proceedings next month.

The Committee on International Veterinary Congress reported that the date for the next congress has been definitely fixed for 1930. The report of the Committee on Humane Society Hospitals was awaited with keen anticipation by veterinarians in general, and particularly those located in our large cities. The report presented by Dr. Robert S. MacKellar, of New York City, was highly encouraging and indicated that a solution of the problem was in sight.

The following were elected to honorary membership:

Prof. C. E. Gerhard Forssell, Veterinary High School, Stockholm, Sweden.

Dr. Sven Wall, State Veterinary-Bacteriological Institute, Stockholm, Sweden.

Prof. Naoshi Nitta, Imperial University of Tokyo, Tokyo, Japan.

The sectional meetings held Wednesday and Thursday mornings were very well attended. In fact, the rooms which had been provided for some of the sections proved inadequate to accommodate the large numbers which had been attracted by the papers announced for these sections. The general session Thursday evening brought out one of the largest crowds of the week. Standing room was at a premium while Dr. Charles H. Mayo



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Dr. T. H. Ferguson, of Lake Geneva, Wis., was on the program for surgery of the foot and udder.

was delivering his address on tuberculosis. This is being published in full in this issue of the *JOURNAL*.

The banquet Wednesday evening was another outstanding event in connection with the meeting. Approximately 400 attended and the program which had been arranged by Dr. C. P. Fitch, chairman of the Subcommittee on Banquet, proved to be a highly enjoyable one. Dr. David S. White acted as toastmaster and everybody agreed that he was "in form." Some unusually fine musical numbers were given in connection with the after-dinner speeches. These were all well received, evidenced

by the numerous encores. Among those who were on the toast list were Lieutenant Governor Nolan, Dean Coffey, of the Department of Agriculture, University of Minnesota, and Dr. George Hilton, Veterinary Director General of Canada. The souvenir banquet program was an artistic affair and bore the seal of the American Veterinary Medical Association, embossed on the front cover. In all probability this afforded an opportunity for many members of the A. V. M. A. to see our official seal for the first time.

The climax of the convention was reached on Friday, at University Farm, where the clinic was staged in six sections, running simultaneously. Dr. W. L. Boyd, chairman of the Subcommittee on Clinic, and Dr. C. P. Fitch, chief of the Veterinary Division, with their associates, were the recipients of a great deal of well-deserved praise for putting on one of the best clinics that members of the A. V. M. A. have ever had an opportunity to attend. The buildings and grounds at University Farm are ideally located and equipped for putting on a clinic of large proportions. Some of the demonstrations were given inside of the buildings and others were put on outdoors. The six sections included horses, cattle, small animals, sheep, swine and poultry. Leaders in these different fields of practice had been selected in advance and were on hand to give demonstrations, perform operations and explain the latest methods of diagnosis and treatment. A picnic lunch was served during the noon hour, on which occasion the gentlemen were joined by the ladies, who had been escorted through St. Paul on a sight-seeing trip during the morning.

The Women's Auxiliary held a very successful meeting Wednesday afternoon. Mrs. Peter Malcolm, of Des Moines, Iowa, was elected president of the organization. Mrs. Arthur Spitz, of Philadelphia, Pa., Mrs. Hamlet Moore, of New Orleans, La., Mrs. H. D. Bergman, of Ames, Iowa, and Mrs. C. P. Fitch, of St. Paul, Minn., were elected first, second, third and fourth vice-presidents respectively. Almost 500 ladies registered during the week.

Some very good newspaper publicity was secured, due to the efforts put forth by Dr. Donald B. Palmer, chairman of the Subcommittee on Publicity. The number of exhibitors was larger than usual. The space originally set aside for the exhibits on the mezzanine floor of the hotel proved to be inadequate and the overflow extended up onto the third floor. Dr. John S. Dick chairman of the Subcommittee on Exhibits, and Dr. William C.

Prouse, chairman of the Committee on Hotels, looked after the comforts of the large number of exhibitors in attendance.

In spite of the unusually large number of persons who attended the meeting, only 175 railroad certificates were turned in. As a result, the certificate plan fell through. Other organizations have reported the same experience, indicative of the inroads which automobile travel has been making on the railroads.

To Dr. Charles E. Cotton, generalissimo of the Local Committee on Arrangements, goes the lion's share of the praise for the huge success of the meeting. His outstanding executive ability in organizing his subcommittees and directing their



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Two well-known Minnesota veterinarians, Drs. W. L. Boyd (left) and C. S. Shore (right), demonstrating some fine points in restraint.

activities was in evidence on every hand. To Mrs. W. L. Boyd and Dr. W. J. Fretz, chairmen respectively of the committees charged with looking after the entertainment for the ladies and gentlemen, go the heartfelt thanks of everybody who participated in the events arranged for their pleasure and comfort. And we must not forget another very important subcommittee—that on finance—with Dr. G. E. Totten as chairman. Had it not been for the efforts of this important part of Dr. Cotton's well-oiled machine, working quietly behind the scenes, the meeting might not have been the great success it turned out to be. To enter-

tain the A. V. M. A. has become quite a job. To say that the Minnesota veterinarians distinguished themselves is putting it very mildly.

CONVENTION NOTES

Dr. E. M. Pickens, of College Park, was the only member from Maryland.

Dr. W. W. Dimock was the sole representative from the Blue Grass State.

South Carolina's sole representative was Dr. W. A. Barnette, of Greenwood.

Dr. L. E. Case, Territorial Veterinarian of Hawaii, was among the early arrivals.

Dr. W. H. Dodge, of Leominster, Mass., was the only registrant from the Bay State.

Drs. H. M. Newton and S. E. Hershey, of Charleston, upheld the honor of West Virginia.

Dr. George H. Glover, of Fort Collins, was the only Colorado veterinarian at the meeting.

Wyoming was represented by Drs. J. T. Dallas and S. E. Springer, both of Cheyenne.

Dr. E. E. Wegner, of Pullman, was the sole representative of Washington at the convention.

Dr. A. C. Johnson, of Cedar City, and Dr. F. E. Murray, of Salt Lake City, represented Utah.

Dr. A. L. Edmunds, of Franklin, N. H., was the only veterinarian present from the Granite State.

Oregon's two best-known veterinarians were present: Drs. W. H. Lytle, of Salem, and B. T. Simms, of Corvallis.

Dr. G. A. Roberts, of Lavras, Minas, Brazil, undoubtedly traveled the greatest distance in coming to the meeting.

Three members represented North Carolina: Drs. Wm. Moore and A. A. Husman, of Raleigh, and H. Calvin Rea, of Charlotte.

About thirty members at the meeting this year in Minneapolis were among those who attended the meeting held in Minneapolis in 1902.

A well-known trio represented New Jersey: Drs. James T. Glennon, Newark; W. Runge, Madison, and George B. Vliet, Hackettstown.

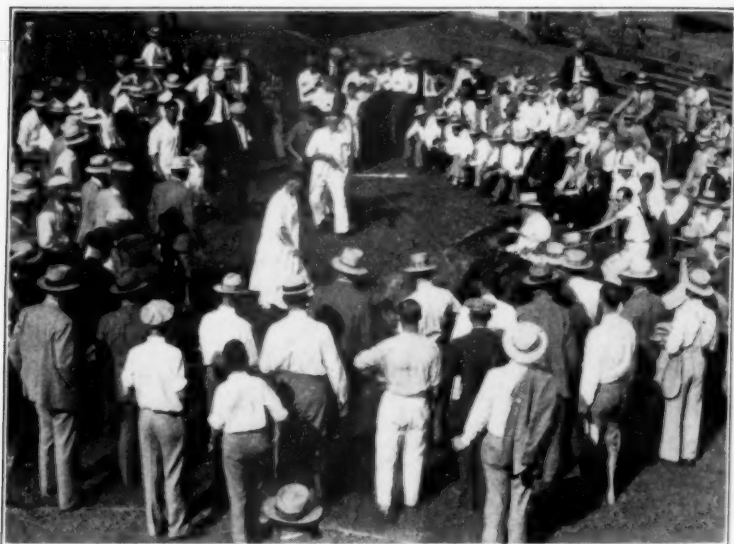
Ten ex-presidents of the A. V. M. A. were in attendance: Glover, Marshall, Mohler, Cotton, Cary, White, Kinsley, Stange, Merillat and Sigler.

A trio of veterinarians registered from Montana: Drs. C. A. Hattersheid, of Glendive; H. Marsh, of Helena, and F. M. Nelson, of Livingstone.

Oklahoma was another state with a trio of members on the register: Drs. R. W. Bowerman, Oklahoma City; Louis H. Moe, Stillwater, and H. W. Orr, Stillwater.

Dr. C. C. Palmer, of Newark, the only member from Delaware at the convention, was very busy renewing his acquaintance among the profession in the Twin Cities.

Nine of the thirteen veterinary colleges were represented by their deans, as follows: Cary, of Alabama; Dykstra, of Kansas;



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Dean Wegner, of Pullman, Washington, at the end of his rope.

Giltner, of Michigan; Glover, of Colorado; Klein, of Pennsylvania; Stange, of Iowa; Wegner, of Washington; White, of Ohio, and McGilvray, of Ontario.

Only five states west of the Mississippi River were not represented: Arizona, Idaho, Louisiana, Nevada and New Mexico. All states east of the Mississippi River had at least one member present, except four of the New England states: Connecticut, Maine, Rhode Island and Vermont.

The names of fourteen members from the Keystone State were found on the list of those present: Drs. E. P. Althouse, Sunbury;

M. F. Barnes and T. E. Munce, Harrisburg; E. E. Bittles, Waterford; Chas. W. Boyd, Sewickley; E. L. Cornman, Marietta; C. D. Evans, Kane; H. W. Turner, New Hope; F. N. Sherrick, Connellsville; M. W. Drake, Wm. H. Ivens, Louis A. Klein, C. J. Marshall and H. K. Wright, Philadelphia.

The Empire State swelled the attendance with fourteen members: Drs. R. G. Bose, Troy; Chas. S. Chase, Bay Shore; E. C. Cleveland, Jr., Cattaraugus; J. Elliott Crawford, Far Rockaway; A. Eichhorn, Pearl River; J. N. Drost, W. A. Hagan, and H. J. Milks, Ithaca; Carl B. Hanson, Saratoga Springs; Wm. H. Kelly, Albany; H. Kock, Brooklyn; H. K. Miller, Mamaroneck; R. S. MacKellar and B. T. Woodward, New York.

APPLICATIONS FOR MEMBERSHIP

(See May, 1928, JOURNAL)

FIRST LISTING

- ABRAMSON, ALEXANDER HENRY 639 Buchanan Place, West New York, N. J.
D. V. S., New York University, 1919
Vouchers: Thomas E. Smith and Henry H. Haigh.
- ALLEN, STANLEY W. Watertown, S. Dak.
M. D. C., Chicago Veterinary College, 1907
Vouchers: C. C. Lipp and M. W. Ray.
- BALL, LEROY C. Titonka, Iowa
D. V. M., McKillip Veterinary College, 1915
Vouchers: C. H. Stange and John B. Bryant.
- BANKS, C. H. Tipton, Iowa
D. V. M., Iowa State College, 1912
Vouchers: Grant B. Munger and John B. Bryant.
- BENNETT, ARCH W. 2729 Coral St., Sioux City, Iowa
D. V. M., McKillip Veterinary College, 1913
Vouchers: E. S. Dickey and G. E. Golden.
- BILDEN, LEONARD MELVIN Northwood, N. Dak.
D. V. M., Ohio State University, 1922
Vouchers: H. L. Frost and A. F. Schalk.
- BJORNSON, BENEDICT K. Mandan, N. Dak.
D. V. M., Ohio State University, 1917.
Vouchers: W. F. Crewe and J. W. Robinson.
- BLAKE, ARTHUR LEE 2622 Washington Ave., Sioux City, Iowa
D. V. M., Ohio State University, 1911
Vouchers: E. S. Dickey and H. E. Breckerbaumer.
- BLOEMERS, JOHN D. 121 Seventh Ave. S., South St. Paul, Minn.
D. V. M., Grand Rapids Veterinary College, 1913
Vouchers: G. E. Totten and Irvin Owens.
- BRATAGER, C. B. c/o Morrell & Co., Sioux Falls, S. Dak.
D. V. M., Chicago Veterinary College, 1917
Vouchers: W. C. Mitchell and J. O. Wilson.
- BROLLING, A. M. 1014 13th Ave. S., Fargo, N. Dak.
D. V. M., Kansas City Veterinary College, 1916
Vouchers: A. F. Schalk and H. P. Roberts.
- BROOKS, JOHN MULLETT 1823 Mackinaw St., Saginaw, S. W., Mich.
V. S., Ontario Veterinary College, 1911
Vouchers: Sam P. Heath and B. J. Killham.

- BRYAN, H. E. D. V. M., Indiana Veterinary College, 1914 Angola, Ind.
Vouchers: A. C. Drach and F. J. Muecke.
- BUCK, JOHN O. D. V. M., Iowa State College, 1927 Hills, Minn.
Vouchers: R. A. Merrill and Ben Anderson.
- CAMERON, F. R. D. V. M., McKillip Veterinary College, 1918 Hawley, Minn.
Vouchers: Harry Hedin and L. A. Benson.
- CASEY, PATRICK H. Farmington, Minn.
M. D. V., McKillip Veterinary College, 1911
Vouchers: Charles E. Cotton and H. Preston Hoskins.
- CATLIN, ORRIS I. Moorhead, Minn.
D. V. M., Ohio State University, 1918
Vouchers: R. Fenstermacher and Harry Hedin.
- CHAPMAN, GEORGE W. Webster, S. Dak.
M. D. C., Chicago Veterinary College, 1908
Vouchers: C. C. Lipp and J. O. Wilson.
- CHASE, DENNIS H. Manchester, Ohio
V. S., Ontario Veterinary College, 1903
Vouchers: D. M. Swinehart and O. V. Brumley.
- COMBS, LAWRENCE GLENN Corozal, Canal Zone
V. M. D., Indiana Veterinary College, 1909
Vouchers: Robert J. Foster and Charles B. Dunphy.
- CORNELL, WILLIAM A. 1605 St. Aubin St., Sioux City, Iowa
D. V. M., Kansas City Veterinary College, 1917
Vouchers: E. S. Dickey, G. E. Golden and H. J. Lawrence.
- COX, JOHN L. 432 11th St., Toledo, Ohio
D. V. M., Ohio State University, 1928
Vouchers: Warren P. S. Hall and Reuben Hilty.
- CURRY, HUGH EDWARD United Serum Co., Wichita, Kans.
D. V. S., Kansas City Veterinary College, 1908
Vouchers: A. T. Kinsley and Chas. W. Bower.
- DORMAN, GEORGE M. 3600 Sixth Ave., Sioux City, Iowa
D. V. M., St. Joseph Veterinary College, 1918
Vouchers: E. S. Dickey and G. E. Golden.
- DURHAM, JESSE W. 329 Eighth Ave. S., Fargo, N. Dak.
V. S., Ontario Veterinary College, 1894
Vouchers: A. F. Schalk and H. P. Roberts.
- EBRIGHT, GLENN L. 214 Fayette St., Hammond, Ind.
M. D. C., Chicago Veterinary College, 1908
Vouchers: J. V. Lacroix and T. A. Sigler.
- ELLIS, WILLIS V. 1207 S. Cecelia, Sioux City, Iowa
D. V. M., Iowa State College, 1909
Vouchers: E. S. Dickey and G. E. Golden.
- ERICKSON, C. B. Pelican Rapids, Minn.
D. V. M., Ohio State University, 1925
Vouchers: C. L. Campbell and L. R. Twete.
- ERICKSON, HENRY E. 299 W. University Ave., St. Paul, Minn.
V. S., Ontario Veterinary College, 1922
Vouchers: H. C. H. Kernkamp and R. Fenstermacher.
- FIEGE, HARVEY J. 3804 Sixty-third St., Kenosha, Wis.
D. V. M., Michigan State College, 1925
Vouchers: A. J. Abbott and J. S. Matteson.
- GABRIEL, MARIE Institut Agricole d'Oka, La Trappe, Que.
M. D. V., University of Montreal, 1928
Vouchers: Albert A. Etienne and George Etienne.

- GETTELMAN, GEORGE A. Hartford, Wis.
M. D. C., Chicago Veterinary College, 1907
Vouchers: James S. Healy and H. D. Larzelere.
- GIDLEY, THOS. W. Malvern, Iowa
D. V. M., McKillip Veterinary College, 1903
Vouchers: H. D. Bergman and W. F. Guard.
- GISEL, EMIL O. 1126 Cornelia St., Sioux City, Iowa
D. V. M., McKillip Veterinary College, 1917
Vouchers: E. S. Dickey and G. E. Golden.
- HADLEY, L. M. Ruthven, Iowa
D. V. M., Iowa State College, 1920
Vouchers: N. L. Nelson and P. V. Neuzil.
- HATTERSCHEID, C. A. Glendive, Mont.
M. D. C., Chicago Veterinary College, 1903
Vouchers: Hadleigh Marsh and Joab P. Foster.
- HELMER, H. O. Cooperstown, N. Dak.
D. V. M., Kansas City Veterinary College, 1913
Vouchers: A. F. Schalk and H. P. Roberts.
- HEUSINKVELD, MARK 4816 Morningside Ave., Sioux City, Iowa
D. V. M., Chicago Veterinary College, 1918
Vouchers: E. S. Dickey and G. E. Golden.
- HOFFMAN, ASA A. Box 299, Detroit Lakes, Minn.
D. V. M., Kansas City Veterinary College, 1906
Vouchers: R. Fenstermacher and H. C. H. Kernkamp.
- HOLLECKER, EDWARD B. 600 N. 17th St., Kansas City, Kans.
D. V. S., Kansas City Veterinary College, 1911
Vouchers: R. R. Dykstra and J. C. Flynn.
- HOWELL, MARTIN ELMER 413 N. Prairie Ave., Sioux Falls, S. Dak.
D. V. M., St. Joseph Veterinary College, 1916
Vouchers: A. T. Kinsley and M. W. Ray.
- JARVIS, KING C. Dept. of Agriculture, Capitol Bldg., Sacramento, Calif.
D. V. M., Iowa State College, 1922
Vouchers: J. P. Iverson and A. C. Rosenberger.
- JOHNSON, CHESTER LAWRENCE Harvey, N. Dak.
D. V. M., Chicago Veterinary College, 1914
Vouchers: A. F. Schalk and H. P. Roberts.
- KEMEN, MATHIAS JOHN 722 State Office Bldg., Lansing, Mich.
D. V. M., Chicago Veterinary College, 1916
Vouchers: T. S. Rich and M. P. Hunt.
- KLETTI, ALVIN J. Slinger, Wis.
V. S., Ontario Veterinary College, 1908
Vouchers: Edward Boesewetter and F. B. Hadley.
- LA FAYETTE, WALTER W. 2543 S. Cypress St., Sioux City, Iowa
D. V. M., Colorado Agricultural College, 1920
Vouchers: E. S. Dickey and G. E. Golden.
- LAIRD, W. R. Sioux Falls, S. Dak.
D. V. M., Iowa State College, 1911
Vouchers: John Doerr and N. L. Nelson.
- LAUDERDALE, BYRON NEWMAN Box 364, Madison, Fla.
D. V. M., Alabama Polytechnic Institute, 1917
Vouchers: T. W. Cole and R. L. Brinkman.
- LEWIS, GAYLORD T. 7121 Oklahoma Ave., Cincinnati, Ohio
D. V. M., Cincinnati Veterinary College, 1915
Vouchers: D. M. Swinehart and E. P. Maxwell.
- LINDQUIST, W. E. 2841 30th Ave. S., Minneapolis, Minn.
D. V. M., Chicago Veterinary College, 1917
Vouchers: Harry Hedin and R. R. Donaldson.

- LINNEMANN, MARTIN C.** St. Joseph, Minn.
 D. V. M., Chicago Veterinary College, 1916
 Vouchers: R. Fenstermacher and H. Preston Hoskils.
- LOWE, JOHN H.** c/o Dr. J. W. Murdoch, Capitol Station, Helena, Mont.
 D. V. M., Iowa State College, 1900
 Vouchers: W. L. Carson and G. H. Ehlers.
- MAYER, NELSON J.** Box 680, Mitchell, S. D.
 M. D. C., Chicago Veterinary College, 1908
 Vouchers: C. C. Lipp and J. O. Wilson.
- McBAIN, WILLIAM E., JR.** 3829 Hazelhurst, Toledo, Ohio
 M. D. C., Chicago Veterinary College, 1894
 Vouchers: Warren P. S. Hall and Reuben Hilty.
- McKENZIE, PETER** Aneta, N. Dak.
 D. V. M., Ohio State University, 1921
 Vouchers: H. L. Foust and A. F. Schalk.
- McKENZIE, WRAITH H.** 138 Chittenden Ave., Columbus, Ohio
 D. V. M., Ohio State University, 1913
 Vouchers: D. M. Swinehart and W. H. Feldwish.
- McLAUGHLIN, EDWARD JOSEPH** P. O. Box 335, Salisbury, Md.
 D. V. M., George Washington University, 1913
 Vouchers: I. K. Atherton and R. C. Reed.
- MEHAN, JOSEPH A.** 351 E. New St., Lancaster, Pa.
 V. M. D., University of Pennsylvania, 1928
 Vouchers: G. A. Dick and E. T. Booth.
- MELVIN, V. W.** 3944 Almeda Drive, Toledo, Ohio
 D. V. M., Cincinnati Veterinary College, 1915
 Vouchers: Warren P. S. Hall and Reuben Hilty.
- METCALF, CARL V.** 1310 Lincoln Ave., St. Paul, Minn.
 D. V. M., McKillip Veterinary College, 1918
 Vouchers: G. E. Totten and M. E. Schwab.
- MIKOLAI, IGNATIUS E.** Wells, Minn.
 D. V. M., McKillip Veterinary College, 1918
 Vouchers: W. L. Boyd and R. Fenstermacher.
- MILLER, LEON E.** 1732 Arlington, Toledo, Ohio
 D. V. M., Cincinnati Veterinary College, 1915
 Vouchers: Warren P. S. Hall and Reuben Hilty.
- NEELEY, SAMUEL WRIGHT** 325 E. Broadway, Toledo, Ohio
 D. V. M., Ohio State University, 1927
 Vouchers: Warren P. S. Hall and Reuben Hilty.
- NELSON, FRANK M.** Box 43, Livingston, Mont.
 D. V. M., Kansas City Veterinary College, 1913
 Vouchers: Hadleigh Marsh and W. L. Boyd.
- NOLLER, OTTO WILLIAM** 6th & Gage Sts., Topeka, Kans.
 D. V. S., Kansas City Veterinary College, 1910
 Vouchers: J. C. Flynn and R. R. Dykstra.
- OAKES, G. H.** Hunter, N. Dak.
 D. V. M., McKillip Veterinary College, 1916
 Vouchers: A. F. Schalk and H. P. Roberts.
- PAINTER, G. G.** Jackson Center, Ohio
 D. V. S., Grand Rapids Veterinary College, 1916
 Vouchers: D. M. Swinehart and Reuben Hilty.
- PARSHALL, CHARLES JONAS** 1130 N. 13th St., Fargo, N. Dak.
 D. V. M., Cornell University, 1928
 Vouchers: H. P. Roberts and A. F. Schalk.
- PETERSON, WILLIAM LANGDON** 336 E. Lafayette St., Stockton, Calif.
 D. V. S., San Francisco Veterinary College, 1917
 Vouchers: A. I. Sorenson and A. C. Rosenberger.

- QUELLAND, JOHN D. 272 Fillmore Ave., Pierre, S. Dak.
D. V. M., Kansas City Veterinary College, 1915
Vouchers: J. O. Wilson and M. W. Ray.
- RAJOTTE, ARTHUR Drummondville, Que.
M. D. V., University of Montreal, 1915
Vouchers: Albert A. Etienne and George U. Etienne.
- RAWN, EDWARD Luck, Wis.
D. V. M., Royal Veterinary College, Copenhagen, 1908
Vouchers: F. B. Hadley and J. S. Healy
- REIHART, O. F. 4802 S. 25th St., South Side Sta., Omaha, Nebr.
D. V. M., Chicago Veterinary College, 1915
Vouchers: Ashe Lockhart and Frank Breed.
- RICHARDS, H. S. 210 Swope St., Pittsburgh, Pa.
V. S., Ontario Veterinary College, 1887
Vouchers: T. E. Munce and S. E. Bruner.
- RODERICK, LEE M. State College Station, Fargo, N. Dak.
D. V. M., Ohio State University, 1915
Ph. D., University of Chicago, 1926
Vouchers: A. F. Schalk and H. P. Roberts.
- SANDERS, ELLMORE FRANKLIN
Massachusetts Agricultural College, Amherst, Mass.
D. V. M., Kansas State Agricultural College, 1927
Vouchers: W. R. Hinshaw and John B. Lentz.
- SASS, CLARENCE WILLIAM 827 Colburn St., Toledo, Ohio
D. V. M., McKillip Veterinary College, 1920
Vouchers: Reuben Hilty and Robert Conover.
- SAUNDERS, FRANCIS HAROLD 336 E. Lafayette St., Stockton, Calif.
D. V. M., State College of Washington, 1921
Vouchers: A. I. Sorenson and A. C. Rosenberger.
- SCHLEGEL, JOHN O. 3600 6th Ave., Sioux City, Iowa
D. V. S., Kansas City Veterinary College, 1911
Vouchers: E. S. Dickey and G. E. Golden.
- SCHNEIDER, ERNEST 914 7th St., Bismarck, N. Dak.
M. D. C., Chicago Veterinary College, 1908
Vouchers: A. F. Schalk and H. P. Roberts.
- SCOTT, JOHN R. Highmore, S. Dak.
D. V. M., Iowa State College, 1924
Vouchers: A. L. Born, Donald B. Palmer and C. C. Lipp.
- SLOCUM, ARTHUR E. c/o Govt. Office, John Morrell & Co., Sioux Falls, S. Dak.
D. V. M., Colorado Agricultural College, 1920
Vouchers: W. C. Mitchell and J. O. Wilson.
- SMITH, EDWIN REED Fort Meigs Hotel, Toledo, Ohio
D. V. M., Michigan State College, 1919
Vouchers: Robert Conover and Warren P. S. Hall.
- SPAYTH, GUY V. Bloomville, Ohio
D. V. M., Grand Rapids Veterinary College, 1915
Vouchers: D. M. Swinehart and O. V. Brumley.
- SPRAGUE, A. W. 3079 S. 32nd St., Omaha, Nebr.
D. V. M., Iowa State College, 1910
Vouchers: W. T. Spencer and M. Jacob.
- STILLEY, LOUIS E. Greenleaf, Kans.
D. V. M., Kansas City Veterinary College, 1917
Vouchers: A. T. Kinsley and Chas. W. Bower.
- STROMLUND, ERNEST V. 3334 Orelans Ave., Sioux City, Iowa
D. V. S., Kansas City Veterinary College, 1911
Vouchers: E. S. Dickey and G. E. Golden.
- TERRY, EDWARD EVERETT 3603 Welsh Rd., Holmesburg, Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1893
Vouchers: G. A. Dick and E. T. Booth.

- VOLLMER, CARL G. R. F. D. No. 8, West Toledo, Ohio
V. S., Ontario Veterinary College, 1908
Vouchers: Robert Conover and Warren P. S. Hall.
- WALSH, A. L. Thief River Falls, Minn.
D. V. M., Chicago Veterinary College, 1920
Vouchers: F. J. Muecke and W. J. Fretz.
- WETTER, CHARLES H. Princeton, Minn.
D. V. M., McKillip Veterinary College, 1920
Vouchers: C. H. Haggard and Donald B. Palmer.
- WHEALY, J. A. 408 N. Euclid Ave., Sioux Falls, S. Dak.
D. V. M., St. Joseph Veterinary College, 1915
Vouchers: W. C. Mitchell and J. O. Wilson.
- WILLIAMS, CHARLES Sisseton, S. Dak.
D. V. S., Chicago Veterinary College, 1891
Vouchers: C. C. Lipp and M. W. Ray.
- WIRTHLIN, JOHN R. 719 Julia Place, South Jacksonville, Fla.
D. V. M., Cincinnati Veterinary College, 1917
Vouchers: T. W. Cole and R. L. Brinkman.
- WRINKLE, ELLERY P. O. Box 366, Oakdale, Calif.
D. V. S., San Francisco Veterinary College, 1910
Vouchers: J. P. Iverson and A. C. Rosenberger.
- ZENOR, PERRY 2811 S. Ceelia St., Sioux City, Iowa
B. S., Colorado Agricultural College, 1904
M. D. C., Chicago Veterinary College, 1906
Vouchers: E. S. Dickey and G. E. Golden.

Applications Pending

SECOND LISTING

- Allen, D. L., Newton, Miss.
Billings, William A., University Farm, St. Paul, Minn.
Bolle, Arthur C., Petersburg, Ill.
Bond, Harold G., 335 Crestview Rd., Columbus, Ohio.
Campbell, H. L., Tuscola, Ill.
Coon, Elvin R., P. O. Box 157, Winamac, Ind.
Crawford, John H., Hinckley, Ill.
Darke, Carlisle N., 103-19 Springfield Blvd., Queens Village, N. Y.
Dennie, Frank W., 5346 Park Ave., Indianapolis, Ind.
Dennis, T. M., Clanton, Ala.
Durant, Adrian Jackson, Veterinary Department, University of Missouri.
Columbia, Mo.
Foster, T. J., Monticello, Ill.
Griessman, Louis, Nanuet, N. Y.
Haenn, Joseph E., 343 Bourse Bldg., Philadelphia, Pa.
Halloran, D. J., Colton, S. Dak.
Hartwich, Homer A., Huron, S. Dak.
Hectorne, Ronald L., Avon, Ill.
Jones, Frederick B., 922 Peoria St., Dixon, Ill.
Joyce, Charles Otto, Wanamaker, Ind.
Kay, David Scott, 3208 36th Ave. S. W., Seattle, Wash.
Kraus, Alvin Herman, Marengo, Iowa.
Lockridge, Forest R., 208 Morgan St., Crawfordsville, Ind.
Lowe, Albert Claud, Buckhannon, West Va.
Marshall, John Wesley, Genoa, Ohio.
McClure, Fred K., 310 S. Chestnut St., Clarksburg, West Va.
McDowell, Clarence, Aberdeen, S. Dak.
Mersch, Louis D., Sioux Falls Serum Company, Sioux Falls, S. Dak.
Murdock, D. C., 1316 South 33rd St., Omaha, Nebr.
Nisley, Frank, Hershey, Pa.
O'Neill, Robert Kenneth, 12041 E. Jefferson Ave., Detroit, Mich.
Owens, James A., El Paso, Ill.

Phelps, Oscar S., 322 E. Maple Ave., Beaver Dam, Wis.
Robinson, Ray S., Madison, S. Dak.
Rugger, Fred Ernest, Lowden, Iowa.
Schrumpf, Harry Russel, 345 N. Jefferson Ave, Indianapolis, Ind.
Scott, Paul Franklin, New Market, Ind.
Selemeyer, Chas. W., 820 S. Newberry St., York, Pa.
Shlimovitz, Benjamin, Black River Falls, Wis.
Smith, Forest F., Emery, S. Dak.
Tovar, Daniel Alfredo, Casilla 237, Callao, Peru, S. A.
Uren, Andrew Waldmere, 714 Stewart Rd., Columbia, Mo.
Wanke, V. F., Belleville, Wis.
Watt, C. S., Collinsville, Ill.

The amount which shall accompany an application filed this month is \$6.67, which covers membership fee and dues to January 1, 1929, including subscription to the JOURNAL.

COMING VETERINARY MEETINGS

- New York City, Veterinary Medical Association of. Academy of Medicine, 5th and 103rd St., New York, N. Y. September 5, 1928. Dr. C. P. Zepp, Secretary, 128 W. 53rd St., New York, N. Y.
- Chicago Veterinary Society. Great Northern Hotel, Chicago, Ill. September 11, 1928. Dr. J. B. Jaffray, Secretary, 2956 Washington Blvd., Chicago, Ill.
- Kansas City Association of Veterinarians. New Baltimore Hotel, Kansas City, Mo. September 18, 1928. Dr. J. D. Ray, Secretary, 400 New Centre Bldg., Kansas City, Mo.
- Southern California Veterinary Medical Association. Chamber of Commerce Building. Los Angeles, Calif. September 19, 1928. Dr. W. L. Curtis, Secretary, 1264 W. 2nd St., Los Angeles, Calif.
- Indiana-Illinois Veterinary Medical Association. Odon, Ind. September 21, 1928. Dr. Frank M. Tade, Secretary, Vincennes.
- Maine Veterinary Medical Association. De Witt Hotel, Lewiston, Me. October 10, 1928. Dr. C. F. French, Secretary, 87 Summer St., Rockland, Me.
- Pennsylvania State Veterinary Medical Association. Laboratory, Pennsylvania Bureau of Animal Industry, Harrisburg, Pa. October 16-17, 1928. Dr. H. R. Church, Secretary, Harrisburg, Pa.
- Ontario Veterinary Medical Association. Ontario Veterinary College, Guelph, Ont. October 17-18, 1928. Dr. H. M. LeGard, Secretary, 223 Main St. N., Weston, Ont.
- United States Live Stock Sanitary Association. La Salle Hotel, Chicago, Ill. December 5-7, 1928. Dr. O. E. Dyson, Secretary, 45 Live Stock Exchange Bldg., Wichita, Kans.

ADDRESS OF THE PRESIDENT*

By REUBEN HILTY, *Toledo, Ohio*

In the first place, I desire to express my most heartfelt appreciation of the great honor which you conferred on me at Philadelphia last year. To me, my election was a gratifying incident, because it was at Philadelphia, in 1908, that I was elected to membership in this Association. In now acknowledging your kindness, I desire to share this signal honor with every practicing veterinarian in the United States and Canada, for I was elected as a representative of that large group of members who practice the art of veterinary medicine and not on account of any particular ability or virtue that I myself possess.

To occupy the office of executive head of the American Veterinary Medical Association is not only a position of great honor but one which, if conscientiously filled, demands a great deal of time, serious thought and earnest endeavor.

The past year has been, to me, one of a great deal of satisfaction, as well as pleasure, in the things accomplished by our Association. There seemed to be a keen interest manifest wherever veterinarians chanced to be in conference, and a more lively interest in the welfare of the profession in general than has been manifest for some time. To those of us who love our profession the motto must ever be, "Onward and upward," for this seems to have been the motto of those earnest men, who, long years ago, formed the nucleus of this wonderful organization, the most important of its kind in the whole world.

Let us hope that those of our members who shall be chosen to guide the destinies of this organization in the future may ever have at heart the deepest and best interests of the veterinary profession, rather than self praise, and shall strive that the onward pace shall not slacken, nor the upward tendency be checked. If we are to judge what the future shall be by what this organization has accomplished in the past, then most of our most optimistic dreams shall surely come true, but we must not forget that the responsibility for our present position and station lay with some of the most brilliant veterinarians the profession has ever known, some of whom were not rich as the world judges a man, but rich in the things that mean satisfaction to

*Presented at the sixty-fifth annual meeting of the American Veterinary Medical Association, Minneapolis, Minn., August 7-10, 1928.

themselves and rich in the knowledge that builded so well the foundation of our organization. So enriched by the endowment of devotion to service and the advancement of our profession, which our predecessors in the executive chair left to us, may not those of our numbers who are to guide the future of this great body be encouraged and pushed on to accomplishments much greater, in keeping with the demands of a more exacting future.

DEATH TAKES HEAVY TOLL

We must not forget that the "grim reaper" has been unusually busy in our ranks during the past year. This reaper, as we well know, is no respecter of persons. This fact is brought home to us in the removal from our ranks of some of our most able counselors, as well as some of the finest characters in the veterinary profession. Men like the late Dr. John A. Kiernan, through whose death was left a void hard for the profession to fill. Following closely on this loss came the loss of another of our best known and beloved members, Dr. E. C. Schroeder, whose death again left a void hard to fill. In addition to the losses we have sustained in the regulatory and investigational branches of the profession, the past year has brought the deaths of quite a number of outstanding representatives among our practitioners. Time will not permit naming all of these, but as examples of the type of men in mind, I will mention such prominent practitioners as Dr. Robert W. McCully, of New York, N. Y., and Dr. Truman E. Gore, of Clarksburg, W. Va. Death removed one member from our honorary roll during the year, Hon. E. T. Meredith, of Des Moines, Iowa, Secretary of Agriculture in the cabinet of President Wilson. To these men the American Veterinary Medical Association owes much for their wonderful individuality, earnestness, devotion and ability. By their work we have profited to a degree we are unable to express in words. It is hoped that the Committee on Necrology will take due note of the death of all members called from our ranks during the past year.

I am of the opinion that the membership expects a presidential address to contain more or less of a résumé of the important things attempted by the organization officials and committees during the year; also I shall take the privilege of making suggestions for the future good of the organization, as I see them.

The work of the Executive Board during the year is to be highly commended. This Board has had a number of difficult problems before it, and let me assure you they have side-stepped none of them. A special committee was appointed by the chairman of the Board to study the feasibility of establishing a permanent home for the Association in some centrally located place. Representatives of this committee met at the Secretary's office to study the needs of the office and reported back to the Executive Board. The consensus of opinion of these men was that the Association should have a permanent home, and we should look forward to the purchase of such a home. They also were of the opinion that the Secretary should have an assistant, to lighten the load now carried by him and allow a greater service.

CONSTITUTION AND BY-LAWS

Later, at this meeting, the Executive Board will present a report embracing numerous suggested changes for our Constitution and By-laws. Almost without exception, these proposed amendments are designed for the purpose of facilitating the transaction of business and to enable the Association to function to better advantage, in keeping with changed conditions. The establishment of official headquarters for the Association and the employment of a full-time secretary-editor have brought many problems and conditions which did not exist under the old system of management. Some of these changes are absolutely necessary in order to give officers and committees more latitude, something which has been found absolutely necessary in connection with the expanding activities of the Association.

The Committee on Intelligence and Education did a fine piece of work in their study of the courses offered to students of agricultural schools, insofar as they relate to veterinary subjects.

The Committee on Legislation met with the Committee on Appropriations, at Washington. A number of prominent members of our Association spoke before this Committee in behalf of the Bureau employes. A most satisfactory hearing was given these men, with the result that the Bureau men were given substantial increases in salary.

Another committee was appointed to look for a suitable assistant to our Secretary. This is a hard matter, since a man to fill this position must have a number of qualifications that are rather hard to find in one man.

The matter of publicity for the profession has been a subject that has interested our Association for years and is being given some serious consideration by the Executive Board. Too many veterinarians mistake advertising for publicity. We have seen a great many of the most glaring forms of advertising, most of them in connection with advertising small-animal hospitals in the large cities where competition is keen. It should be brought to the attention of these men that the kind of advertising they are using not only places themselves in the class of the advertising specialist, so called, but does more or less harm to the profession in general in the eyes of other learned professional men. There is no doubt that something along the line of ethical publicity must be done and a recommendation will be made, further along in this address. A committee of men capable of studying this subject was appointed and no doubt will have some concrete suggestions to make on this important matter.

AMERICAN HUMANE ASSOCIATION

We have for several years heard numerous complaints from some of our larger cities against the methods used in the operation of animal shelters and hospitals by humane societies. A contact was made with Mr. Sydney H. Coleman, president of the American Humane Association, who was found to be very anxious that these differences should be ironed out. At his suggestion, a committee was appointed to confer with a similar committee appointed from his organization. These committees met on July 10, in New York City, and a most satisfactory agreement was reached. Our Association's committee was asked to outline a plan for humane societies to follow. During this meeting, you will be given the report of this committee. If only this one piece of work is finished and nothing more, I would feel that the year had been well spent.

Allow me to mention just one more accomplishment of the past year, all credit of which must be given to our most capable Secretary—that of holding a meeting of the Committee on Program and whipping into shape the completed program weeks before the date of the annual meeting. The program you have looked over is without a doubt the most comprehensive one ever offered to our Association members and I am only sorry that all of the 4,000 members can not sit with us and enjoy the good things offered. An earnest effort has been made to offer a well-

balanced program that would interest the largest possible number of veterinarians.

The time is long past, in fact never was, when a veterinarian could expect to keep abreast of the times unless he affiliates himself with organizations of this kind, at whose meetings are discussed the problems of the practicing veterinarian, as well as the problems of the sanitarian, the laboratory man and the research man. One branch of the profession can not expect to be successful without the cooperation of all the others. We are all aware that curative veterinary medicine is yet a very important part of the work of the veterinarian, but the veterinarian who expects to spend years to come in the profession must be able to give his clients more and more advice on disease prevention and for a considerable part of this knowledge we must depend on the men who spend their time and efforts in the research field of veterinary medicine. The field of preventive medicine is growing all the time and I am willing to make the prediction that before long we will have a great many veterinarians who will spend their time advising herd- and flock-owners on their sanitary problems for the prevention of disease. The intelligent breeder will be better satisfied to pay, and pay well, for advice to keep him out of trouble, than to pay well for relief after he has gotten into trouble and suffered large losses.

IMPORTANCE OF PREVENTIVE MEDICINE

Let me assure you that unless the practicing veterinarians pay more and more attention to so-called preventive medicine, we will be compelled to bow to state medicine. True, we must depend on state medicine in the handling of outbreaks of dangerous diseases, on account of the authority with which its men are clothed, but unless the practicing veterinarian is himself prepared to render the stockman this service in preventing disease in his herds and flocks, he will clamor for state medicine.

Allow me to picture to you what my idea of a veterinarian is. The standing of a veterinarian in his community depends altogether on himself. If he is capable in his professional accomplishments and demands the respect of the public through capable work and clean living, he will receive all the respect any other professional man receives.

A wide-awake veterinarian of today is a man among men in his community. He takes an interest in public affairs, in agriculture, in the problems of dairying, stock-raising of all kinds,

poultry-raising, and the diseases that make these industries unprofitable, if allowed to go unchecked. He is a man who never loses an opportunity to enlighten himself through any source whatsoever, whether that source be affiliating himself with the various veterinary organizations that are available to him, or live stock organizations, or any organization from which he can add anything to his store of knowledge that will be of benefit to his clientele.

It is, of course, a much easier matter for a veterinarian in a rural district, a small city or town, to make his contacts. There he is found sitting in their councils and is respected as much as any man. In the larger cities these contacts are harder to cultivate. In such places, everyone seems to be so busy making ends meet that they are liable to become much more selfish and care less for the association of others, but this may be accomplished if one really tries.

VETERINARIANS AND PET SHOPS

In many of the larger cities there has been for some years a practice developing that gives me a great deal of concern, as well as many other men with whom I have talked. This is the practice of mixing commercialism with the practice of veterinary medicine. I speak of the combination pet shop and veterinary hospital, owned and operated in most cases by a graduate veterinarian. Places of this kind are to me the greatest menace to ethical veterinary practice in our cities. The danger I see ahead for the profession in such places is that veterinarians in general will be judged, by the public, by the same standard used in measuring the pet shop proprietor who is not a veterinarian. The veterinarian who operates such a combination is liable to find it hard to sell his service. The owner of an animal is liable to expect to get consultation, service and remedy for the same price he pays for the remedies on the shelves of any other pet shop or drug store. It seems to me that the only thing a veterinarian should rightfully have to offer for sale is his service and make that the very highest type it is possible to make.

As I stated earlier in this address, I would take the privilege of making such recommendations for the good of the organization, as I see these recommendations:

1. *Publicity:* The veterinary profession has always been a more or less retiring, and at times even timorous, profession. We are, however, rapidly learning to assert ourselves in the

true light of accomplishments, not in a bombastic, egotistical manner, but in a well-poised, impartial attitude, which commands the respect of those whom we serve. Publicity has become an essential in the modern sale of any product, and the product of the veterinarian's training and skill is no exception. Other professions are using publicity campaigns to give to the public a better insight into the services which they are able to render. This has long been a question before our profession. There is no doubt in my mind but that a carefully planned campaign, carefully carried out, could not help but give the public a fuller realization of the need of the service a veterinarian can give. We have too long hidden behind the screen of self-consciousness and might it not be better for us if we would allow the world to grade our worth, fully informed of the services which a veterinarian has and is capable of rendering?

PUBLICITY VERSUS ADVERTISING

I am now speaking of legitimate publicity, not so-called advertising, which cheapens instead of benefits the profession. Instead, I mean publicity that will help us rise from a more or less obscure position to one of greater public approval. By this, not only will our own viewpoint become clearer, but our essential needs in the structure of modern life will become more obvious to all. We are a useful profession and have as good a right to inform the laity of our ability to cope with their live stock problems as has our sister profession of informing them of their ability to cope with human ills. I am certain that all veterinarians are proud of the accomplishments of our profession, which extends into a wide field of endeavor. I am also convinced that the general public is uninformed of our various activities and unlimited service.

Few people realize, and in reality appreciate that, except for the service of veterinarians, infectious and contagious diseases, to which our domestic animals, including poultry, are heir, would be so prevalent that profitable live stock production would be an utter impossibility. As proof as to the importance of this statement, one need but refer to the pages of history which furnish unmistakable evidence that the security and prosperity of any state and nation is in grave danger when its live stock industry begins to decay through the ravages of diseases that can be controlled and eradicated.

I recommend to this Association that as soon as possible the Secretary be given a suitable assistant, that some time may be given to a carefully planned campaign of publicity and that it be carried on by the Secretary's office under the direction of the Executive Board. I am of the opinion that more good could be done in this way than through a campaign carried on by a commercial advertising company.

2. *Section officers:* I recommend that the officers of the various sections be appointed by the president. The sections are often pressed for time to complete their programs and the officers are often elected in a hurry, when only a few are left in the meeting, and not enough attention is paid to their selection in reference to their geographical location, making it hard to communicate with each other, which is very liable at times to make the building of a program a slow process.

3. *State association meetings:* I recommend that there be some arrangement made by which it would be possible for at least all state association meetings to be attended by an official or representative of the American Veterinary Medical Association, so designated. This can be done with very little additional cost to our Association.

4. *Expulsion:* In our Constitution and By-laws there is no provision made for the expulsion from the membership of the A. V. M. A. of a member who has committed a felony. Therefore, I recommend that some provision be made in our Constitution and By-laws by which such a member may be expelled. This provision should give the Executive Board the power to do this at any one of its meetings.

I can not close this address without giving credit to all the officers who have so willingly assisted us during the past year, to all the men on the standing committees, as well as the men on the special committees, who also did wonderful work.

The resident state secretaries in most of the states did a wonderful piece of work in coming to this meeting with a larger number of new members than at any meeting for several years. It is gratifying to me, of course, that my own state should come to this meeting with a larger number of new members than any other state. This, let me assure you, is not due to any popularity of my own, but to the yeoman-like work of Ohio's Resident Secretary, Dr. D. M. Swinehart.

At a meeting of the Northwestern Ohio Veterinary Medical Association, at Findlay, when it was announced that Ohio

would go to the annual meeting with more new members than any other state, that Association voted unanimously to pay the expenses of sending Dr. Swinehart to this meeting, as a reward for this splendid piece of work. Let me suggest that this might be an inducement to other resident secretaries in the future.

It would surely be the height of ingratitude for me not to thank our capable and untiring Secretary for the wonderful cooperation he has given me during the year. I believe I have had a chance, better than any president this Association has ever had, to keep in close touch with our Secretary, being in very close proximity to his office and in all likelihood I have visited the office of the Secretary oftener than any other president has had the opportunity to do, thus being able to know his worth.

In conclusion I can only express the hope that our sixty-fifth annual meeting, held, as it is, in this great metropolis, whose name stands for energy and enthusiasm, will, as it now promises to do, surpass in point of interest and in number of those in attendance all previous gatherings of this Association, and that this organization shall continue to prosper until, with every eligible veterinarian enrolled in its membership, it becomes the great organization it deserves to be.

THE RIGHT OF A PROFIT

There is just one condition on which men can secure employment and a living, nourishing, profitable wage, for whatever they contribute to the enterprise, be it labor or capital, and that condition is that some one make a profit by it. That is the sound basis for the distribution of wealth and the only one. It can not be done by law, it can not be done by public ownership, it can not be done by socialism. When you deny the right of a profit you deny the right of a reward to thrift and industry.

—Calvin Coolidge.

VETERINARIANS VISIT EUROPE

Drs. William J. Lentz and H. C. Campbell, of the University of Pennsylvania Veterinary School faculty, accompanied by their families, sailed on the S. S. Pennland, on July 14, for a sojourn of two months in Europe. They planned to visit some of the most important veterinary schools and laboratories in a number of European countries.

THE DANGER TO MAN OF BOVINE AND AVIAN TUBERCULOSIS*

By C. H. MAYO, Rochester, Minn.

Tuberculosis as a scourge to mankind is one of the oldest of diseases, its beginning is buried in antiquity, and earliest reliable records indicate that it caused many deaths; and for many years in the recent past it was referred to as Captain of the Men of Death, because more people died of tuberculosis than of any other one disease. For a long time tuberculosis was thought to be an inherited disease and it was not known that we caught it one from another. Gradually it came to be recognized as a contagious disease and, about the middle of the last century, Villemin demonstrated by inoculation of material from the tubercles of tuberculous animals into rabbits that it was an infectious disease. Nearly twenty years later, in 1881, Koch proved it, after he discovered the germ, the tubercle bacillus that causes tuberculosis.

For many years, too, it had been known that cattle suffered from a similar disease and the tubercle bacillus was found in the tubercles in cattle.

Many physicians then came to think that man contracted tuberculosis from cattle. Some enthusiasts then believed that most human tuberculosis came from cattle and the danger of bovine tuberculosis to man was greatly exaggerated. Some students of tuberculosis had noticed that the germs obtained from human sources did not seem to be exactly the same as the germs obtained from cattle and, in 1898, Dr. Theobald Smith tabulated a series of these differences which seemed to indicate that the germs as found in the cattle were different from the germs found in humans and that one could tell by studying the germs whether they were cattle or human tubercle bacilli.

Koch carried this idea to an extreme when he declared, before the London Congress on Tuberculosis, in 1901, that the germs were not the same and that there was practically no danger of man contracting tuberculosis from cattle or about as much as there was danger to man from an inheritance of the disease, which of course means none at all, and he said that he did not deem it advisable to take any measures against it spreading

*Presented at the sixty-fifth annual meeting of the American Veterinary Medical Association, Minneapolis, Minn., August 7-10, 1928.

from cattle to humans. Koch's opinions were based chiefly on clinical observations that, in Germany, intestinal tuberculosis was rare. Being a presumption that for bovine tuberculosis present in milk to cause tuberculosis in humans, it must be demonstrated as primary lesions in the intestinal tract, which, of course, is a wrong presumption. Primary lesions at the point of entry, either in the intestinal tract or the lungs, are very uncommon. Possibly the reason why intestinal tuberculosis is so rare in Germany is because more mothers nurse their babies or employ wet nurses, or they boil the milk.

Koch's views were immediately studied by many scientific workers, individually and collectively, all over the world. The German government authorized an investigation and the British government appointed a Royal Commission. The Pennsylvania State Live Stock Sanitary Board, the New York City Health Department and the officials of the U. S. Bureau of Animal Industry also carried on investigations. As a result, Koch's opinion as to the transmission of bovine tuberculosis to man has been fully disproved. But Koch's position in the scientific world was most outstanding because, of the many who were searching for it, he was the one who had discovered the tubercle bacillus. His opinions carried great weight and his words had a great influence on public opinion and they still have, and Koch's statements are the foundation today for a few scientists, some doctors and many lazy people who feel that we are exaggerating the menace of bovine tuberculosis to humans.

KOCH MINIMIZED DANGER OF BOVINE TUBERCULOSIS

As different scientists presented evidence and opinions contrary to Koch's, he came to modify his opinions, but he continued to his death to minimize the menace of bovine tuberculosis to humans. At the Sixth International Congress on Tuberculosis, at Washington, in 1908, when faced with almost unanimously contrary reports and opinions from other scientists, he opened the discussion on the relation of human and bovine tuberculosis by saying that "human beings may be infected by bovine tubercle bacilli, but serious diseases from this cause occur very rarely and preventive measures against tuberculosis should therefore be directed primarily against the propagation of human tubercle bacilli." To counteract the evidence of all the other authorities from every country, he mentioned the possible errors in research work and said that "the experiments carried on at the Kaiser-

liche Gesundheitsamt in Berlin are the only ones which fulfill in every way the foregoing experimental requirements. Those of the British Commission fail in several respects and all other work which has come to my notice answers these requirements so poorly that I can grant them no weight, at least as regards the occurrence of bovine tuberculosis in man." Apparently he thought no one knew how to investigate but himself. He referred to those who differed with him as opponents and said that "the few known cases in which bovine tuberculosis is said to have produced a general and fatally progressive tuberculosis in man appear to me not to be above suspicion." Apparently no one's results could be depended upon but his own.

In contradiction of Koch's opinions and in defense of their methods of investigation, the following spoke: Professor G. Sims Woodhead, Cambridge, England; Johannes Fibiger, of Copenhagen; M. P. Ravenel, of Madison, Wisconsin; Prof. Chas. W. Duval, Tulane University, New Orleans; Dr. Chas. F. Dawson, Newark, Delaware; and others. Koch finally declared that he had never denied that bovine tuberculosis is found in man and tried to narrow the discussion to a consideration of bovine tuberculosis in the lungs of humans. He asked whether "any case of pulmonary tuberculosis exists in which tubercle bacilli of the bovine type were found, not once but repeatedly." When Professor S. Arloing, of Lyons, France, Prof. G. Sims Woodhead, of Cambridge, England, and Prof. Fibiger, of Copenhagen, mentioned such cases, Koch again questioned the accuracy of their investigations and reports and finally concluded by saying:

I admit that bovine infection can occasionally occur, and I desire not to be understood as disregarding the endeavors to extirpate bovine tuberculosis, as far as these endeavors are dictated by agricultural and economic reasons. But I mean that it would be wrong to give to those proposals the leading place in front of the efforts to combat human tuberculosis.

Quite a modification of his position in London, in 1901, when he said:

I should estimate the extent of the infection by milk and by flesh of tuberculous cattle, and the butter made of this milk, as hardly greater than that of hereditary transmission, and I therefore do not deem it advisable to take any measures against it.

Koch's opinion as to the transmission of bovine tuberculosis to man was conclusively disproved by the final report of the British Royal Commission, presented after nine years of study and investigation, where it said:

We have investigated many instances of fatal tuberculosis in the human subject in which the disease was undoubtedly caused by a bacillus of the bovine type and by nothing else. . . . Man must therefore be added to the list of animals notably susceptible to bovine tubercle bacilli.

And again:

We must conclude that mammals and man can be reciprocally infected with the disease (tuberculosis). The possible danger to man through reciprocity in this sense was, of course, the more important question presented to us, and as we have conclusively shown that many cases of fatal tuberculosis in the human subject have been produced by the bacillus known to cause the disease in cattle, the possibility of such infection cannot be denied.

And the importance of this conclusion is not diminished by the fact that the majority of such cases examined by us occurred in young children, or by the merely local results following the administration of the human type of bacillus to bovine animals. Bovine animals are not completely immune to the human tubercle bacillus, and adult human beings can be infected with the bovine type, even the pulmonary form of the disease in man being sometimes caused by the bovine tubercle bacillus.

And again:

So far as these 128 cases have been examples of tuberculosis in the adult, and especially when they have been cases of pulmonary tuberculosis, the lesions of the disease when fatal have been referable with few exceptions to human bacilli. Only rarely has a pulmonary lesion in adult man yielded the bovine bacillus. Our experience of abdominal tuberculosis in the human subject has been very different, especially as regards children. Of young children dying from primary abdominal tuberculosis, the fatal lesions could in nearly one-half of the cases be referred to the bovine bacillus and to that type alone. In children, too, and often also in adolescents suffering from cervical gland tuberculosis, a large proportion of the cases examined by us could be referred to the bovine tubercle bacillus. We have already in an earlier portion of this report referred to the importance of infection by the bovine type of tubercle bacillus in cases of lupus occurring in adolescents and children.

Whatever, therefore, may be the animal source of tuberculosis in adolescents and in adult man, there can be no doubt that a considerable proportion of the tuberculosis affecting children is of bovine origin, more particularly that which affects primarily the abdominal organs and the cervical glands. And, further, there can be no doubt that primary abdominal tuberculosis, as well as tuberculosis of the cervical glands, is commonly due to ingestion of tuberculous infective material.

And again:

We have found cases of tuberculosis in adult man, sufficiently extensive to incapacitate the patient for the ordinary duties of life and in two instances ending fatally, in which we were able to attribute the disease solely to the effects of the bovine tubercle bacillus. Though of the 56 cases of adolescent and adult tuberculosis which came under scrutiny no more than five yielded bacilli of the bovine type, we cannot say that this figure adequately represents the proportion of like cases obtaining among the tuberculous population generally.

Bovine tubercle bacilli are apt to be abundantly present in milk as sold to the public when there is tuberculous disease of the udder of the cow from which it was obtained. This fact is, we believe, generally recognized though not adequately guarded against. But these bacilli may also be present in the milk of tuberculous cows presenting no evidence whatever of disease of the udder, even when examined postmortem. Further, the milk of tuberculous cows not containing bacilli, as it leaves the udder may, and frequently does, become infective by being contaminated with the feces or uterine discharges of such diseased animal. We are con-

vinced that measures for securing the prevention of ingestion of living tubercle bacilli with milk would greatly reduce the number of cases of abdominal and cervical gland tuberculosis in children, and that such measures should include the exclusion from the food supply of the milk of the recognizably tuberculous cow, irrespective of the site of the disease, whether in the udder or in the internal organs.

In view of such a report which was practically duplicated almost unanimously by research workers in Germany, France, Denmark, the United States and other parts of the world, one would think the question of the menace of bovine tuberculosis to humans was settled nearly twenty years ago. But so great was Koch in the world of tuberculosis research and study that some of his followers continued to carry on the fight in support of his opinions and to this day opponents of the fight to eradicate bovine tuberculosis quote Koch's old arguments in spite of the fact that they have been so many times conclusively disproven. Unfortunately some of the laymen who are personally interested or, having committed themselves in exaggerated statements like Koch's, continue to defend them to the last, discounting all evidence which would disprove their contentions.

At the International Congress on Tuberculosis in Rome, in 1912, the question was keenly discussed and the special conference drew up the following resolutions, which were subsequently accepted by the International Congress as a whole. The text of the resolutions ran as follows:

(1) The prophylaxis against tuberculosis must principally be directed against the suppression of contamination from man to man, and especially in the family; (2) contamination of man by bovine infection is of less frequency. Nevertheless it is necessary to maintain all measures against infection of bovine origin.

It is of course advisable to endeavor to find out how frequently bovine tuberculosis occurs in humans. After studying reports and statistics from all parts of the civilized world, I am satisfied a conservative estimate of the danger of bovine tuberculosis to humans would be that 25 per cent of tuberculosis in children and 5 per cent of all tuberculosis in humans is due to infection with the bovine germs, which, in the majority of instances, were received through the consumption of tuberculous milk. Bovine tuberculosis sometimes causes lung tuberculosis in humans, but usually it causes the other forms, such as in the bones and joints, glands in the neck, chest, and abdomen, the membranes of the brain and spinal cord and generalized miliary tuberculosis.

In Minnesota, in sixteen years from 1910 to 1925, there were 34,570 people who died of tuberculosis and 6,343 of those died of other forms than lung tuberculosis. On a basis of 5 per cent

of the total, this would mean that 108 people died here, every year, of bovine tuberculosis. It has been estimated that $\frac{1}{2}$ of 1 per cent of lung tuberculosis and 10 per cent of other forms of tuberculosis in humans is caused by the cattle germ. Figuring on that basis then, 48 people died here every year of bovine tuberculosis. If we accept this lowest estimate of 48 annual deaths, in addition to the hundreds of cases of bovine infection which does not kill, but results in crippling and incapacitating for a long period or the rest of life, I am sure we are justified in all our efforts to eradicate bovine tuberculosis.

Dr. L. Van Es, of the University of Nebraska, has lately done some extensive investigations, which he is still carrying on, with tuberculous material obtained mostly from our clinic and he has already found that bovine tuberculosis occurred in four of them.

These figures and estimates will of course vary in different localities, states and countries, depending first on the amount of tuberculosis in their cattle originally and on the amount of effort being made to eradicate it by tuberculin-testing, and secondly on their protection through pasteurizing milk. It will be lower in the South and higher in the East and much higher in European countries, especially in England and Scotland, where very little tuberculin-testing has been done and where very little of the milk is pasteurized.

Harold J. Stiles, surgeon of the Royal Edinburgh Hospital for Sick Children, at the International Congress of Medicine in London, in 1913, said:

The investigations which have been carried on by my assistants, Mr. John Fraser and Dr. A. P. Mitchell, from the material derived from the Royal Edinburgh Hospital for Sick Children, if confirmed by other observers, show that in Scotland at any rate, the bovine bacillus is a more frequent cause of those forms of surgical tuberculosis in children which we are now considering, namely, tuberculosis of the bones and joints and lymphatic glands, than is the human bacillus.

Next, when we turn to the postmortem records obtained from the children's hospitals in this country, we find, according to the statistics of Shennen, Still, Coutta, and others, that in about 25 per cent of the children in whom tuberculous lesions are found at the postmortem, infection had taken place through the alimentary tract.

My own clinical experience derived from the large amount of surgical tuberculosis met with in the Royal Edinburgh Hospital for Sick Children led me to the conclusion that the bovine bacillus was responsible for far more surgical tuberculosis in this country than the findings of the Royal Commission, the German Commission, and all the results published by other workers, would lead us to suppose.

It occurred to me that the wealth of material derived from my operations on bone and joint and gland cases at the Royal Edinburgh Hospital for Sick Children might be utilized with advantage to determine the relative frequency of human and bovine infections in these forms of tuber-

culosis. Mr. John Fraser, now assistant surgeon to the hospital, undertook the research as regards the bone and joint cases.

Of the 70 cases investigated, 39 were cases of joint disease, and 31 of bone disease. Of the 70 cases the bovine bacillus was present in 41, the human bacillus in 26, and both types in 3. As regards the age incidence, all the patients but 3 were under 12 years of age. It is interesting to note that in each of the 3 adults, the bacillus was of the human type. Forty-one of the children were under 4 years of age, and of these in no less than 78 per cent the disease was due to the bovine bacillus. The milk history was also carefully inquired into, and it was observed that the bovine bacillus was the organism found in all the children less than twelve months old, and that each of these had been entirely nourished upon cow's milk. Of the twelve children between one and two years of age, eight owed the disease to the bovine bacillus, and every one of these had been brought up from birth on cow's milk. It was interesting to note, too, that in none of the children artificially fed had the milk been sterilized.

My present assistant, Dr. A. F. Mitchell, who was formerly my house surgeon at the Children's Hospital, has for the past two years been working at the etiology of tuberculous affections of the cervical glands. He has investigated 72 consecutive cases of tuberculous cervical glands operated on at the Royal Edinburgh Hospital for Sick Children.

Of the 72 cases it was found that 65, i. e., no less than 90 per cent contained the bovine bacillus, while only 7 (10 per cent) contained the human bacillus. I may here mention that Dr. Mitchell also investigated 8 adult cases, 6 of which contained the bovine bacillus and 2 the human bacillus.

I desire to draw special attention to the fact that Dr. Mitchell's results give a far larger proportion of bovine infections than has been found by other observers. The great value of his results lies in the fact that they have been obtained from a consecutive series of cases derived from one institution. Moreover, by going carefully into his records of the cases, he has been able to correlate his pathological findings with the clinical histories, and he has found that these have afforded a sufficient explanation for the very large proportion of bovine infections.

Of the 72 cases no less than 36 occurred in children under 5 years of age, and of these all but 3 were bovine infections. The maximum incidence occurred during the second year, and it is interesting to note that Dr. Mitchell found that 84 per cent of the children under two years of age had been brought up since birth on raw cows' milk.

With regard to the history of tuberculosis in other members of the family, it was found that out of 65 children infected with the bovine bacillus, there was not a single case in which a history of pulmonary tuberculosis could be obtained in the family.

The supposition is that in each of these families the children acquired the tuberculous disease from an infected milk supply. In the 72 cases there were only three instances in which a history of pulmonary tuberculosis could be obtained in the parents, and it is interesting to note that in each of these three cases it was the human bacillus which was isolated from the cervical glands.

The World War interrupted research work and investigations on the subject and since then the majority of the reports of such have come from Great Britain and show that the percentage of bovine infection remains high.

Present knowledge on this subject was summarized by Dr. A. Stanley Griffith, in his paper read before the National Milk Conference (London, 1922). In the course of his remarks he gave details in regards to 1,215 English and Scottish cases, in

which the type of tubercle bacillus had been determined by identical methods employed for demonstrating the differential characteristics of the infecting tubercle bacilli. He showed that, of the total number, 935 (77 per cent) were of human origin, and 280 (23 per cent) were of bovine origin. Dr. Griffith showed separate tables in respect of different varieties of human tuberculosis from which I have prepared the following table:

TABLE I—*Proportion of bovine to human infection in the different varieties of human tuberculosis, compiled from tables given by A. Stanley Griffith, at the National Milk Conference (London, 1922)*

	NUMBER OF CASES	HUMAN	BOVINE	PERCENTAGE BOVINE
(1) Cervical gland tuberculosis	116	62	54	46.5
(2) Bone and Joint tuberculosis:				
(a) England and Wales	476	389	87	18.3
(b) Scotland	28	20	8	28.6
(3) Lupus	126	62	64	50.8
(4) Scrofuloderma	52	32	20	38.4
(5) Genito-urinary tuberculosis	17	14	3	17.6
(6) Examination of postmortem material from children:				
(a) Local Government Board series	113	93	20	17.7
(b) Royal Commission series	46	27	19	41.3
(7) Tuberculous meningitis	12	10	2	16.6
(8) Pulmonary tuberculosis	229	226	3	1.31
Totals	1215	935	280	23.05

Dr. Griffith stated amongst his conclusions:

Bovine tuberculosis is an important source of human tuberculosis in Great Britain. The bovine tubercle bacillus shares in the production of all the chief clinical varieties of human tuberculosis and causes an appreciable loss of life, especially in childhood. The proportion of bovine to human infections is highest in children under five years of age, and in those forms of tuberculosis which are primary in the alimentary tract.

The age incidence and the anatomical distribution of the primary lesions clearly point to cow's milk as the source of the infection with bovine bacilli.

Cow's milk containing living tubercle bacilli ought not therefore to be used for human consumption, and stringent measures should be taken to prevent the sale of such milk.

It is estimated by Cobbett, from the above data, that the bovine type of bacillus causes about 6.44 per cent of the total deaths from tuberculosis of all kinds in England and Wales, or approximately 3,000 deaths every year.

In addition to the estimated 3,000 who die, the number of people who do not die but who suffer for a long period, perhaps throughout life, from tuberculosis as a result of drinking infected milk, is very much higher.

It is interesting to note that the percentage of bovine infection in pulmonary tuberculosis in humans (1.3 per cent) is much

higher in England and Wales than in other countries reporting.

More recently Dr. A. S. Griffith read a paper entitled, "Tuberculosis of bovine origin in the human subject," at the Eleventh National Conference on Maternity and Infant Welfare, held in London, July 5-7, 1927. It deals with 541 cases of bone and joint tuberculosis, with the result that 18.7 per cent of them were found to be caused by tubercle bacilli of the bovine type. This percentage refers to patients of all ages; if one takes only children under five years of age (102 cases), the percentage so infected naturally rises and here it is 30 per cent. Under ten years (327 cases) it is 25 per cent.

One might go on indefinitely quoting statistics from recognized authorities. Today no recognized authorities and few physicians doubt the transmissibility of bovine tuberculosis to humans, but there are still some who minimize the danger even to the extent of opposing the efforts of those who are endeavoring to eradicate the disease from cattle on the ground that the menace is so slight as not to constitute a public health problem. I am satisfied that the figures I have quoted prove conclusively that the danger of bovine tuberculosis to man is quite sufficient to justify all the effort and all the expenditure to eradicate the disease from cattle and to justify me as Health Officer at Rochester in insisting that all the milk used in Rochester must be from cows negative to the tuberculin test, whether the milk is to be pasteurized or not.

ALL REACTORS SHOULD BE REMOVED

I am of the opinion that no cow with tuberculosis should be tolerated in the milk supply. The difficulty is to know the ones that have tuberculosis. There is no absolutely certain way of telling. The best way is to test the cattle with tuberculin and consider all those that react as potentially dangerous. The tuberculin test is not 100 per cent perfect but it is by far the best method we have of determining those cattle that are tuberculous and all reactors should be removed from the milk supply to ensure safety. Occasionally a cow with gross general tuberculosis does not react to the tuberculin test, but generally such can be discovered by the veterinarian's examination made at the time, as such animals usually look badly, are evidently sick, non-breeders and an economic loss. This is just like humans, with gross chronic lesions, who fail to react, having so much of their own or they are recovering from temporary exacerbations.

In addition to minimizing the frequency of bovine tuberculosis in humans, those who would let down the bars against tuberculous cattle in the milk supply contend that it is only when there are gross lesions in the udder that there is a possibility of the disease spreading through the milk to man and they say that only cows with gross udder lesions of tuberculosis should be excluded from the milk supply. Such a contention is not correct.

In addition to the fact that udder lesions may develop in a tuberculous cow after an examination has been made, it has been proven that a tuberculous cow may excrete tubercle bacilli in its milk without having any demonstrable lesions in the udder. Furthermore, it has also been proven that a cow with lung tuberculosis, which is much more common than udder tuberculosis, will cough up and swallow and pass in its dung the tubercle bacilli which get into the milk from the air, the dust, and the cow itself.

In discussing this question, Mitchell, of Edinburgh, says:

The important practical point to consider is the extent to which tuberculous cows yield tubercle bacilli in the milk. Until a few years ago it was a commonly accepted view that tubercle bacilli were only found in milk when the udder was affected. As a result of the experimental work of Schroeder in America, and more recently that of the last Royal Commission on Tuberculosis in this country, we now know this not to be the case. Their results prove indisputably that tubercle bacilli may and do gain access to milk from cows which clinically show no signs of udder tuberculosis, or indeed, any form of tuberculosis.

The very absence of any definite sign in the earlier stage (of udder disease) is one of the greatest dangers of this condition. According to Delepine it is practically impossible for the veterinary surgeon unaided to discover by ordinary inspection early tuberculous lesions of the udder.

Dr. E. C. Schroeder, referred to by Dr. Mitchell, reported, at the Sixth International Congress on Tuberculosis at Washington, as follows:

Tests, made at the experiment station of the United States Bureau of Animal Industry, demonstrated that many seemingly healthy tuberculous cattle expel virulent tubercle bacilli from their bodies per rectum with their feces.

Cows were collected from several dairy herds and kept under observation about two years. They were in excellent general condition and had no visible symptoms of disease; they were not known or suspected to be tuberculous until they were tested with tuberculin, and prior to their removal from the dairy herds to which they originally belonged their milk was regularly sold to city consumers.

During the first two months microscopical examinations revealed that 41 2/3 per cent of the cows were intermittently expelling acid-fast bacilli per rectum; eighteen months later the number had increased to 10, or 83 1/3 per cent; that is, it had doubled, though the majority of the cows still retained their apparently good condition and showed no symptoms of tuberculosis.

The various facts presented clearly seem to justify the following conclusions:

1. Tuberculous cows, wholly free from visible symptoms of tuberculosis, frequently expel tubercle bacilli from their bodies per rectum.

2. Tubercle bacilli in the feces of tuberculous cows are not dependent upon intestinal tuberculosis, but commonly have their origin in the lung.

5. Since the feces of cattle are a common, almost universal impurity in milk, the presence of tubercle bacilli in the feces of tuberculous cows makes it practically impossible to obtain milk at all times free from tubercle bacilli, either from tuberculous cows or in the environment of tuberculous cattle.

Now, let us bear in mind that from 15 to 30 per cent of our dairy cows are affected with tuberculosis; that the examination of over 300 samples of milk from the local market showed that $5\frac{1}{2}$ per cent, or 1 in 18, contained virulent tubercle bacilli, notwithstanding that the best available data indicate that the tuberculous condition of the local dairy herds is not as bad as that of the herds supplying milk to most other Eastern cities of the United States, and certainly not as bad as the condition of the herds from which European cities obtain their dairy products, and it will become evident that the tuberculous cow is, by herself, a sufficient source of virulent bacilli to account for the infection of the whole human race.

Extracts of the report of the British Royal Commission on tuberculosis referred to by Mitchell follow:

The third interim report of the Royal Commission on Tuberculosis is devoted to the investigations of Dr. F. Griffith, on the presence of tubercle bacilli in the milk and feces of cows not showing any signs of disease of the udder during life.

The feces and the milk of naturally tuberculous cattle have been tested by means of inoculation and feeding experiments upon animals. Observations have been made on six milch cows. Three of the animals showed clinical evidence of tuberculosis, but in none of the six could any tuberculous disease of the udder be detected during life.

The experiments which we have carried out with regard to the infectivity of the feces of tuberculous cows were dictated by knowledge of the fact that dirt of various kinds from cows and the cowshed is almost constantly present in milk as it reaches the consumer. Cows suffering from extensive tuberculosis of the lungs must discharge considerable numbers of bacilli from the air passages in the act of coughing, and some of the bacilli thus expelled may find their way into the milk. But our experiments indicate that the excrement of cows obviously suffering from tuberculosis of the lungs or alimentary canal must be regarded as much more dangerous than the matter discharged from the mouth or nostrils. We have found that even in the case of cows with slight tuberculous lesions tubercle bacilli in small numbers are discharged in the feces, while, as regards cows clinically tuberculous, our experiments show that the feces contain large numbers of living and virulent tubercle bacilli.

Three cows manifestly diseased all showed tuberculosis in both feces and milk. In three cows, positive reactors not manifestly diseased, two showed tuberculosis in feces, none proven in milk.

In 1899 Rabinowitch and Kempner published an important investigation on the milk of cows reacting to tuberculin. They examined the milk of fourteen animals, only one of which exhibited disease of the udder manifest by physical examination; but in ten out of these fourteen they succeeded in proving that

tubercle bacilli were present in the milk which the animals yielded.

In 1907 Dr. J. R. Mohler, then chief of the Pathological Division of the U. S. Bureau of Animal Industry, reviewing the evidence which had been accumulated on this subject, wrote as follows:

That milk coming from a tuberculous udder is capable of transmitting the infectious principle is conceded by all who have given the subject any consideration. It has been equally established that in advanced generalized tuberculosis, the udder may secrete tubercle bacilli without showing any indication of being affected. Careful experiments performed by trained and eminently responsible investigators have also demonstrated beyond reasonable doubt that tubercle bacilli at certain times may be present in the milk of cows affected with tuberculosis to a degree that can be detected only by the tuberculin test, so that in a herd of cows in the various states of tuberculosis it is to be expected that some of them will secrete tuberculous milk, which, when mixed with other cows' milk, makes the entire product dangerous.

How frequently market milk is infected by tuberculosis germs will of course vary in different cities, states and countries, depending on the amount of tuberculosis present in the cows supplying the milk.

Miller (*Edinburgh Medical Journal* (1914) xii, p. 156) gives the result of an investigation of 101 samples purchased from milk shops distributed in different parts of the city, and of these sixteen were found to contain living tubercle bacilli. Similarly, Mitchell (*Edinburgh Medical Journal* (1914) xii, p. 315), investigating 201 samples from certain districts of the city, found tubercle bacilli in 41 of these (20 per cent).

We read in Klein's "Principles and Practice of Milk Hygiene," as follows:

The Frequency of Tubercle Bacilli in Market Milk.

Anderson examined 253 samples in Washington in 1906 and found tubercle bacilli in 6.72 per cent. In Philadelphia, in 1908, Campbell examined 130 samples of raw milk and found tubercle bacilli in 13.8 per cent; twelve samples of milk sold as "pasteurized" were also examined by him and one sample, or 8.3 per cent, contained virulent tubercle bacilli. Hess found tubercle bacilli in 16 per cent of the samples he examined in New York in 1909, and of 144 samples examined by Tonney of Chicago in 1910, 10.5 per cent were infected with tubercle bacilli.

Heinemann, in his book, "Milk," says:

Probably in all municipalities where raw milk is sold some of it is infected with tubercle bacilli.

It has been estimated that about 40 per cent of tuberculous cattle, which give no outward indication of the disease, discharge tubercle bacilli with their excreta.

Since tubercle bacilli are discharged in large numbers with feces, it follows that market milk is frequently contaminated with them.

Investigators in various cities have given the percentage of market milk containing tubercle bacilli at 5-17, and even higher. A conservative estimate might place the average at 6-8 per cent.

Today a large percentage of human tuberculosis is cured or at least arrested. By using Bang's method or some similar care of cows with tuberculosis, the disease may be arrested in them too. To carry out such a plan on an ordinary farm with even high-priced cattle in this country is hardly commercially possible. This also accounts for the fact that but few cows die of tuberculosis because they are sold for butchering, as the large proportion of them have intestinal or glandular tuberculosis which does not prevent their use for meat in this country. Carcasses badly diseased are of course not used for meat but are sent to the tanks.

Regarding the danger to man of avian tuberculosis the evidence is not so conclusive. Although it is often demonstrated that the human being is infected with bovine tuberculosis, the avian type is very rarely found in man. I have had two patients at the Clinic in whom avian tuberculosis was demonstrated surgically and pathologically.

Von Kurt Lederer has reported a case, and Loewenstein cites two cases, in which avian tuberculosis occurred in poultry-breeders and in 1913 he expressed the opinion that avian tuberculosis is more common in man than had been theretofore accepted.

Pansini expressed the opinion that such infection actually occurs and Nocard encountered avian bacilli in human lesions.

Recently Plum, of Copenhagen, has published a monograph reporting cases of avian tuberculosis discovered in humans by several observers.

That the bacillus of avian tuberculosis is pathogenic for man is further corroborated by Rabinowitch and Lipschultz.

Dr. Gilbert J. Thomas and Dr. Frank L. Jennings, of Minneapolis, report having found evidence of avian infection in some kidney cases.

Dr. James B. Murphy, of the Rockefeller Institute, claims he is finding avian infection in some cases of Hodgkin's disease. Dr. Van Es, of the University of Nebraska, found acid-fast bacilli in material from a case of Hodgkin's disease and his investigation of the case is still going. Dr. Van Es has done considerable investigation of this subject and has reported:

The very common transmission of the infection to swine already has been shown to be a source of enormous losses; and the fact that tuberculosis of avian origin has also been found to exist in cattle, certainly points to the possibility of it being at least a disturbing factor in the eradication technic now being followed in the bovine disease. . . .

It is probably rare as a cause of tuberculosis in man in this country, but European investigators have described a number of cases. Typing experiments with human material, now under way at the Nebraska Experiment Station, have thus far not yielded any evidence of avian infection, but the investigation is far from complete at this time.

On another occasion Van Es has written:

After reviewing the evidence it becomes apparent that many strains of avian bacilli are actually pathogenic to mammals, but to a considerably less extent than the organisms associated with spontaneous mammalian disease.

With the possible exception of swine, the danger to mammals from avian infection sources is probably very slight and negligible. We do not know, however, how soon an avian organism in a mammal may become adapted to its new surroundings and become capable of producing mammalian disease with regularity. Such a possibility is indicated by the results obtained by Bang; and Cadiot, Gilbert and Roger.

In view of the possible source of danger, however slight it may be, it is apparent that prudence demands that fowl tuberculosis be so managed as to prevent its transmission to other farm stock.

And again, says Van Es:

It is not possible to eradicate tuberculosis completely from one species without eradicating it also from the others. In the tuberculosis of cattle and of poultry this may be somewhat of a hypothesis, but in the disease of swine it is a reality resting upon solid ground. Just as long as we have bovine, avian, and human tuberculosis, there will be tuberculosis of swine for the same reason that the elimination of human tuberculosis can never be complete as long as bovine infection remains as a real or potential source of mischief.

BUREAU TRANSFERS

Dr. Daniel J. Bynacker (U. S. C. V. S. '13), from New Orleans, La., to Newark, N. J., on meat inspection.

Dr. Wm. Poseiner, Jr. (Cin. '13), from Newark, N. J., to Cincinnati, Ohio, on meat inspection.

Dr. Herbert C. Berger (Cin. '17), from Cincinnati, Ohio, to Jackson, Miss., on tick eradication.

Dr. Herman F. Arndt (McK. '14), from Chicago, Ill., to Madison, Wis., on meat inspection.

Dr. Grover C. Pieper, from Cairo, Ill., to Baltimore, Md., on meat inspection.

Dr. Chester N. Dale, Jr. (O. S. U. '19), from Chicago, Ill., to Bethesda, Md.

Dr. J. A. Wilkinson (U. P. '07), from Fort Worth, Texas, on tick eradication, to Fort Worth, Texas, on meat inspection.

Dr. Wm. G. Hart, from Fort Worth, Texas, to Chicago, Ill., on meat inspection.

Dr. Henry A. Taggart (K. C. V. C. '15), from Jacksonville, Fla., to Jackson, Miss., on tick eradication.

Dr. Edgar Heiny (Ind. '08), from Jacksonville, Fla., to Jackson, Miss., on tick eradication.

Dr. Joseph B. Schorfheide, from Madison, Wis., to Chicago, Ill., on meat inspection.

Dr. Elvon S. Dickey (K. C. V. C. '06), from Milwaukee, Wis., to Sioux City, Iowa, in charge of meat inspection.

Dr. Albert E. Behnke (Chi. '92), from Sioux City, Iowa, to Milwaukee, Wis., in charge of meat inspection.

Dr. Merwin L. Crans (K. C. V. C. '16), from Toledo, Ohio, to Philadelphia, Pa., on meat inspection.

Dr. Hubert Bunyea (U. S. C. V. S. '18), from Washington, D. C., to Bethesda, Md.

THE RELATIONSHIP BETWEEN THE COLOR AND THE FAT CONTENT OF BOVINE CORPORA LUTEA*

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HISTORICAL INTRODUCTION

The color of bovine corpora lutea is due to the presence of a pigment which several investigators have proved to be carotin, the same pigment which is present in the roots of carrots, from which the name is derived. Palmer,¹ in his monograph, "Carotinoids and Related Pigments," gives a complete résumé of the history of this pigment. He speaks of the work of Thudichum who, in 1869, attempted to classify the yellow, red and orange pigments of both plants and animals. He grouped all of the yellow pigments from animal sources into one group, giving them the name "Luteins." In this group he included the pigment of the corpus luteum, the yellow pigment of blood-serum, of adipose tissue and butter, and of the yolk of eggs. His reason for so grouping them was because they appeared to have certain characteristics in common. It is now known that his "luteins" included several different pigments and that the characters, which he thought were common to all, applied only to certain pigments of the group. Palmer deplors the use of the name "luteins," as used by Thudichum, as this term should be used only in connection with the pigment of the corpus luteum and should not be applied to such pigment as that of the yolk of eggs which "can in no way be related to the corpus luteum." He has shown that this pigment is identical with one of the plant pigments, xanthophyll.

Palmer further reports that carotin, the pigment from the roots of carrots, was the first vegetable pigment to be discovered and also the first chromolipoid of mammalian origin to have been isolated. He refers to the work of Piccolo and Luben who, in 1866, isolated carotin from the corpora lutea of cattle and to that of Holm, who also isolated it in 1867. Of Holm's work Palmer writes as follows:

It is gratifying to note how accurately Holm described the crystalline form, the color of the crystals, both alone and when dissolved in various solvents, and the characteristic blue color reaction with nitric acid, all of which later helped to identify the pigment as carotin.

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Palmer speaks of the work of Capranica who, in 1871, also isolated carotin from cows' ovaries and obtained it in crystalline form. Because this pigment so closely resembled that of the yolk of eggs and that of the retina of the eye he regarded them as being identical. Capranica observed that the pigment of the corpus luteum was soluble in petroleum ether and in carbon disulphid. It is by the use of these solvents that the pigment of the corpus luteum and that of the yolk of eggs can be differentiated. Palmer says that, in 1878, Kühne first concluded that these two pigments were not identical. This was not known to be true until 1913, when Escher² proved the pigment of the corpus luteum to be carotin.

Escher, in 1913, collected 146 kg. of ovaries from cattle and sheep and by the use of petroleum ether extracted 0.45 gm. of pure carotin from them. His technic of isolation is given in detail by Palmer. In concluding his original article, Escher says that the 0.45 gm. of carotin which he isolated was undoubtedly only a small portion of the carotin which was present. Escher made a careful comparison between the carotin which he obtained, with pure carotin from another source, in molecular weights, melting point, and the ease with which each was dissolved in various solvents, and found them to be identical.

Thatcher³ gives the following characteristics for carotin. It occurs in crystalline and amorphous forms in many plants. The crystals are in the form of flat plates which are orange red by transmitted light and greenish blue by reflected light; its melting point is 168° C. Carotin is insoluble in water, slightly in cold alcohol or acetone, readily soluble in petroleum ether, ether, chloroform, and carbon disulphid. Solutions are strongly fluorescent. The chemical formula is $C_{40}H_{56}$, a hydrocarbon.

That the yellow pigment of corpora lutea consists of carotin has not been proved to be true except in the case of cows and ewes. Palmer¹ says that the pigment of human corpora lutea is probably a mixture of carotin and xanthophyll, and in the horse it is probably carotin. He has not been able to identify it in corpora lutea of swine and he refers to the work of Bergh, Miller and Brochmeyer who, in 1920 failed to isolate carotin from corpora lutea of these animals.

That the quantity and quality of lipoid and fat in corpora lutea of bovine ovaries vary, depending upon the stage of gestation, was observed by Tricomi,⁴ in 1921. He made a series of observations on the quality and quantity of fat present in

bovine corpora lutea of animals killed in different stages of gestation. He found that from the time of the formation of the corpus luteum up to the fifth month the amount of fat increases, then it decreases for a time, to increase again from the seventh month on. He found that the fat is nearly all lipoid for the first two months but that the lipoid did not increase as the amount of neutral fat increased but decreased from the third month until at the termination of pregnancy, when it had almost entirely disappeared.

Von Mikulicz-Rädecki⁵ found that the quantity and quality of lipoids in human corpora lutea also underwent important changes during the period of gestation. It was found that as long as the cells function, lipoids containing nitrogen and phosphorus are present; cholesterol and cephalin were identified. The first symptom of degeneration that was observed was the appearance of neutral fats. These were found to increase gradually until finally only neutral fats, fatty acids, and soaps were found. According to this source the complex lipoids, phosphatids, cerebrocides, and cholesterol are hormones produced by the lutein cells.

Fenger⁶ also found bovine corpora lutea to be rich in phosphatids. He found them to contain fifteen times as much as normal muscle, with which he made comparison.

McNutt⁷ reports on the corpora lutea of nineteen non-pregnant cows and heifers which were killed at varying definite times following the onset of estrum. This investigator made studies on the origin, development, and retrogression of lutein cells and fats of the corpus luteum; the following is a brief review of his conclusions: The corpus luteum of the ox develops from the cells of the theca interna and from those of the granulosa. Soon after ovulation the theca externa contracts, throwing the theca interna and granulosa into folds. In the deeper folds the theca interna thus projects toward the center of the follicular cavity. This folding facilitates the vascularization of the granulosa and the ingrowth of connective tissue into the developing corpus luteum. At the beginning of the development of the corpus luteum the lutein cells developing from the theca interna and those developing from the granulosa contain varying numbers of lipoid granules, the theca cells containing more than those of the granulosa. As the development of the corpus luteum continues, the cells of the granulosa take on more lipoid until on the seventh day after heat when they may be found to con-

tain far more lipid than the lutein cells developing from the theca interna. On the fourteenth day following the period of estrum, the lipid content of the various lutein cells has increased considerably, the granules in some of the granulosa cells having coalesced to form large inclusions. This probably is the first evidence of involutionary change. Nineteen days after heat, some of the granulosa cells are almost free from lipid granules, some have small granules in varying numbers while still others have large granules throughout the endoplasm, probably indicating an involutionary stage. The lutein cells developing from the theca interna as a rule contained less lipid granules than those developing from the granulosa. Occasionally, however, a theca cell contained a mass of large granules. The amount of lipid content increases up to about twenty-four days after heat, but from then on becomes less and less.

McNutt concluded that there is a distinct relationship between the amount of pigment in bovine ovaries and the amount of fat present, and the following statements present his observations regarding color changes in corpora lutea. The color of the corpus luteum of estrum passes through definite color changes from its formation after ovulation to its degeneration at the end of the twenty-one day period. The very young corpus luteum presents a light brown or brownish-yellow color, except in those cases where there has been marked extravasation of erythrocytes into the granulosa, when it is red. The brownish tinge is gradually lost until by the seventh day the color has changed to an "old gold"; by the fourteenth day it has become a bright golden yellow and by the twentieth day the color has changed to a true orange. As involution progresses the color gradually deepens, ultimately changing to a red, as found in vestiges of corpora lutea. Regarding this point, McNutt says:

By sectioning a red body with the freezing microtome and examining it immediately, irregularly shaped and sized red granules will be seen.

Finally, McNutt concludes that the pigment of corpora lutea is closely associated with their lipid content. He found that the pigment of the red vestiges was slowly soluble in alcohol while that of the yellow corpora lutea is readily soluble; the red pigment however, is readily soluble in ether, chloroform, xylol and benzene.

Elder,⁸ in 1925, in making a detailed microscopic study of bovine corpora lutea from pregnant and non-pregnant animals, found that the corpus luteum of estrum and that of pregnancy

undergoes fatty degeneration at the end of the 21-day period and at the termination of pregnancy, respectively.

SIZES AND SHAPES OF BOVINE OVARIES. CYSTIC OVARIES

This study sought to determine if there is any relation between the color of bovine corpora lutea and their fat content and represents data gathered from 194 animals of all ages, from heifers that had just reached breeding age up to aged cows, both non-pregnant and in all stages of gestation. One animal carried a fetus slightly more than 1 cm. in length and several were evidently in the last month of pregnancy.

To obtain the material for study the abattoir was visited and the ovaries and uteri obtained directly from the animals on the killing-floor. Each uterus was incised in order to determine if the animal was pregnant or not and if found pregnant the stage of gestation was estimated by the size and development of the fetus. During the first part of the study the breed of the animal was not observed. Later, on the supposition that possibly the color of the corpus luteum might be a breed characteristic, much as the yellow color of the skin of Guernsey cattle is characteristic of the breed, the breed of the animal from which the ovaries were obtained was recorded.

This method of collecting the material for study did not make it possible to obtain the history of the animals from which the ovaries were obtained. That the history of the animals would have been desirable and of considerable interest is shown by data obtained from some of the ovaries. For instance, animal 12, a non-pregnant cow, had one normal ovary which contained a corpus luteum, 22 mm. by 18 mm. in size, color V (chart I), which was undergoing cystic degeneration, two vestiges, one 9 mm. by 5 mm., which was distinctly red, the other being smaller but of the same color, and also a large almost matured graafian follicle. Paired with this ovary, a testicle was found (fig. 1). The testicle was small, measuring, after being hardened, 25 mm. by 19 mm. and of the consistency of the testicle of a cryptorchid horse. A complete history of this animal would have been very interesting.

Of the 194 pairs of ovaries collected, nine showed cystic degeneration of the corpus luteum. That of animal 22 contained a cystic corpus luteum; the cyst was 20 mm. in diameter, and its walls consisted of the peripheral remnants of the corpus luteum, being 1-1.5 mm. in thickness. The ovary of animal 178 con-

tained two corpora lutea, one of which was cystic. The cyst measured 12 mm. in diameter, with wall of corpus tissue not more than 1 mm. in thickness. The ovary of animal 169 contained a corpus luteum which showed a blood clot at its center, 3 mm. in diameter. The ovaries of animal 188 were very unusual. One showed two corpora lutea of about equal size, 10-12 mm., both IX in color. The other ovary contained another corpus luteum which was 14 mm. in diameter and X in color, showing deposits of black pigment.

The ovaries studied showed considerable variation in shape and size. In some almost the entire ovary consisted of corpus luteum, in which case the ovary would be roughly spherical in



FIG. 1. Ovary and testicle obtained from animal 12.

shape. In others the ovary was nearly the shape of an isosceles triangle, the corpus luteum making up the apex. In others it was found to be roughly the shape of a right angle triangle. There appeared to be no relation between the shape of the ovary and whether the animal was pregnant or not. However, the ovaries from the pregnant animals were slightly larger than those from non-pregnant animals. The average size of the ovaries from 119 pregnant cows and heifers was 34.9 mm. by 24.87 mm. while the ovaries from 65 non-pregnant animals averaged 33.35 mm. by 23.41 mm. This slight difference is probably of no particular significance.

The size and shape of the corpora lutea also varied considerably. Those from pregnant animals were slightly larger than

those from non-pregnant animals. The average size of the corpora lutea from 115 pregnant animals was found to be 21.82 mm. by 19.51 mm., while those from 54 non-pregnant animals averaged 20.07 mm. by 17.80 mm. Elder also found that the corpora lutea from pregnant cows were slightly larger than those from non-pregnant animals. His corpora lutea from pregnant animals averaged 19.3 mm. by 16 mm. Our work agrees very closely with his. The corpora lutea from pregnant animals encountered in this study averaged 0.52 mm. longer and 0.3 mm. wider, and the corpora lutea from non-pregnant cattle averaged 0.77 mm. longer and 1.8 mm. wider than those reported by Elder.

The shape of the corpora lutea varied but the majority were nearly spherical. Only very few showed a distinct protuberance. In several cases the corpus luteum projected from the ovary as a round, more or less hemispherical enlargement. In most cases where the corpus luteum formed a protuberance it was of the type Elder speaks of as being shaped like an Erlenmeyer flask. In those cases the protuberance was 6-8 mm. broad, with a concave outer surface.

DETERMINATION OF THE COLOR OF BOVINE CORPORA LUTEA

In all cases the size of the ovaries and color of the corpora lutea were determined after hardening for 48 hours in 10 per cent formalin. After hardening, the ovaries were split longitudinally and measurements of the ovary and of the corpus luteum taken and the color recorded.

Elder, in his studies on bovine corpora lutea, divided them into ten groups, depending on their color. These ten colors he designated as follows: (1) no color; (2) light or pale yellow; (3) yellow; (4) bright yellow; (5) dark yellow; (6) dirty or muddy yellow; (7) yellow orange; (8) orange; (9) green brown; (10) red or brown. This classification is so indefinite as to be unsatisfactory. No two investigators would agree on just what color should be classed as light-yellow, a yellow orange, or any other of these designated. A classification in order to be satisfactory must be one so definite that two or more investigators should be able to take a given number of corpora lutea and group them into practically the same identical groups.

An attempt was therefore made to set up a standard color-chart, graduated from almost white to orange, in certain definite graduation, to assist in grouping the corpora lutea into definite

groups. With the cooperation and aid of Prof. Smith, of the Department of Physics of the Ohio State University, Maxwell color discs were so combined on a Bradley color-wheel that, when revolved at high speed, the desired ranges of color were obtained. The several colors consisted of the following combinations of the Maxwell discs:

- | | |
|-------|------------------------------------|
| I. | White 65%, yellow 35%. |
| II. | White 40%, yellow 50%, orange 10%. |
| III. | White 30%, yellow 50%, orange 20%. |
| IV. | White 20%, yellow 50%, orange 30%. |
| V. | White 10%, yellow 50%, orange 40%. |
| VI. | Yellow 50%, orange 50%. |
| VII. | Yellow 40%, orange 60%. |
| VIII. | Yellow 30%, orange 70%. |
| IX. | Yellow 20%, orange 80%. |
| X. | Yellow 10%, orange 90%. |

After the ten shades were established, a color chart was made upon which each particular shade was duplicated. The color chart consisted of ten colors, ranging from nearly white to orange. In duplicating the several shades of the chart the following water colors were combined in varying amounts:

1. White: "Chinese white," prepared by Favor, Ruhl, and Co., New York and Chicago.
2. Yellow: "Cadmium," pale, prepared by the same firm as above.
3. Orange: "Chrome yellow," No. 3, prepared by Devoe and Reynolds.

With this chart as a guide, it was not at all difficult to classify properly all except a very few of the corpora lutea studied. Several of the vestiges were slightly darker than color X, several had the characteristic muddy appearance described by several investigators, and one, that of animal 180, a non-pregnant heifer, was a dark reddish-brown, almost the color of liver, and could not be classified in any of the ten groups.

We found, as did Elder, that the majority of the corpora lutea studied fell within but a few of the ten groups. Of the 181 which could be classified from pregnant and non-pregnant cows, 141 (77.8 per cent) fell within the groups VI-IX, inclusive.

The color of the corpora lutea as recorded in this work was in all cases determined after fixation for 48 hours in 10 per cent formalin. McNutt⁷ states that the color soon fades and to be correct should be determined immediately after slaughter. In order to determine the degree of fading that would occur during fixation, ovaries from animals 176-192, inclusive, were incised immediately, washed in water to remove as much blood from the surface as possible, and the color recorded. They were then

I.



White 65%; yellow 35%.

II.



Orange 10%; yellow 50%; white 40%.

III.



Orange 20%; yellow 50%; white 30%.

IV.



Orange 30%; yellow 50%; white 20%.

V.



Orange 40%; yellow 50%; white 10%.

VI.



Orange 50%; yellow 50%.

VII.



Orange 60%; yellow 40%.

VIII.



Orange 70%; yellow 30%.

IX.



Orange 80%; yellow 20%.

X.



Orange 90%; yellow 10%.

CHART I

placed in 10 per cent formalin for 48 hours and the color again determined at the end of that time. We found that in most instances the color at the end of 48 hours had faded one shade of the color-chart. In other words, a corpus luteum which was color IX when first incised was color VIII at the end of 48 hours. Ovaries 187 and 190 had not faded appreciably while ovary 186 had faded from X, when fresh, to VIII. These results would indicate that in most cases the colors as herein recorded would have been one shade of the chart darker if the ovaries had been incised when fresh.

It was suggested that perhaps the fading of the color during the process of the hardening was due to the action of the formalin on the blood present in the tissues. In order to determine if this is the case, ovaries from animals 193 and 194 were fixed in Kaiserling's solution. In both instances the color of the corpora lutea was IX when fresh. After being fixed in Kaiserling's solution, the color had not faded perceptibly but the corpora lutea had taken on a muddy yellow appearance. From but two corpora lutea definite conclusions cannot be drawn.

McNutt states that the activity of the corpus luteum is indicated by the amount of blood which oozes out when the gland is incised immediately after slaughter. Of these seventeen ovaries from pregnant and non-pregnant cows and heifers we could not detect much difference in the amount of blood which oozed from the cut surface of the corpora lutea. What variation there was appeared to have no relation to the stage or presence of pregnancy. In animal 182, pregnant two months, animal 184, heifer, pregnant one month, animal 187, aged cow, pregnant seven months, animal 190, aged cow, pregnant one month, animal 191, cow, pregnant one and one-half months, and animal 192, heifer, pregnant two months, there was slight hemorrhage from the cut surface of the corpora lutea, while, on the other hand, from the corpus luteum of animal 181, heifer, pregnant two months, that of animal 183, heifer, pregnant one and one-half months, and that of 185, heifer, pregnant two months, there was considerable hemorrhage. From the corpus luteum of animal 186, an aged cow, pregnant five months, there was much hemorrhage. There appeared to be no significant relationship between the amount of hemorrhage and the stage of gestation.

Table I gives the degree of pigmentation of the color of the corpora lutea studied as found in non-pregnant animals and in pregnant animals in different stages of gestation.

TABLE I.—*Relative occurrence of varying degrees of pigmentation of corpora lutea*

REPRODUCTIVE STATUS OF ANIMALS	NUMBER OF ANIMALS	INTENSITY OF PIGMENTATION*									
		I	II	III	IV	V	VI	VII	VIII	IX	X
Non-pregnant	67	0	1	1	6	6	5	12	12	12	12
1-2 mos.	60	0	1	1	1	2	14	22	11	7	1
3-4 mos.	36	2	1	0	1	2	9	7	7	6	1
5-6 mos.	10	0	0	1	0	0	5	1	2	1	0
7-9 mos.	8	0	0	0	0	0	1	2	2	3	0
Unclassified	13	—	—	—	—	—	—	—	—	—	—
Totals	194	2	3	3	8	10	34	44	34	29	14

*Roman numerals refer to colors on chart I.

THE DETERMINATION OF THE RELATIVE AMOUNT OF FAT IN BOVINE CORPORA LUTEA BY STAINING

Sections of corpora lutea from ovaries which had been hardened in 10 per cent formalin were sectioned on the freezing microtome, 15 microns in thickness. After cutting, the sections from each corpus luteum were preserved in 10 per cent formalin until stained.

The stain chosen was Sudan III and was used as follows:

1. Sections removed from 10% formalin and placed in water for 30 seconds.
2. Placed in 60% alcohol, 30 seconds.
3. Stained with a saturated solution of Sudan III in 80% alcohol for 3 minutes.
4. Removed from stain and placed in 60% alcohol for 30 seconds.
5. Placed in water for 30 seconds.
6. Counterstained with Delafield hematoxylin for 20-30 seconds.
7. Washed in two changes of water for 30 seconds.
8. Mounted on slide in glycerin jelly and the edges of the cover-slip sealed with Canada balsam in xylol.

Long and Evans⁹ recommend the use of Nile Blue sulphate for the staining of fat in tissues. This stain was tried out, but except for those preparations of which photomicrographs were desired was not found superior to Sudan III. They recommend that after staining with Nile Blue sulphate the preparations should be rendered alkaline by being treated with 1 per cent NaOH, upon the addition of which the globules of fat are changed from a dark blue to red. It was found that, if the preparations were not rendered alkaline, the globules photographed very beautifully with the use of a "G" filter. Many of the photomicrographs shown in the plates were stained with Nile Blue

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sulphate without the preparations being rendered alkaline. By staining a large number of preparations and comparing those rendered alkaline with those not so treated the apparent amount of fat was the same. It was found, however, that the preparations which were not rendered alkaline could not be preserved for a long period of time as there was a tendency for the stain to crystallize out. It was found that for those preparations which were rendered alkaline that it was necessary to use alkaline glycerin jelly in which to mount them.

Several other stains were tried out and preparations stained with them were compared with preparations stained with Sudan III. Frozen sections of corpora lutea stained with Scharlach R could not be distinguished from those stained with Sudan III. In a recent number of *Stain Technology*, French,¹⁰ of the Army Medical School, recommended the use of Oil Red O and of Candle Blue for the staining of fat in tissues. The efficiency of Oil Red O was compared with that of Sudan III and this stain appeared to give slightly better preparations than when the same sections were stained with Sudan III. It appeared to give better definition and the lutein cells appeared to show up with finer detail.

The relative amount of fat in frozen sections of bovine corpora lutea which had been stained with Sudan III was determined as follows:

Each preparation was carefully studied and the amount of fat recorded, the amount present being expressed in plus signs. In a section in which there was but a trace of fat the amount was expressed with one plus sign and in one containing the maximum the amount was expressed by six plus signs. The entire number of preparations were observed twice, the second time without referring to the former results; then, where there were discrepancies between the two observations, these preparations were studied for the third time and the results of the third observation were regarded as the correct reading.

A record of the observations made in this study is to be found in table II. It may be noted that in this table is a column giving the percentage of ether extract as determined by the Soxhlet method. A full description of the technic followed in obtaining the percentage of ether extract of various samples is to be found a little later in this paper. It should be noted that table II records only the results obtained in the determination of the relative amount of fat in representative samples; all corpora lutea were stained with Sudan III but not all were subjected to ether extraction.

An examination of table II shows very clearly that no direct relationship exists between the color and the fat content of

TABLE II—Color and fat content of corpora lutea studied, grouped according to color

ANIMAL	MONTHS PREGNANT	COLOR OF CORPUS LUTEUM	FAT CONTENT AS PERMITTED	
			BY STAINING WITH SUDAN III	BY ETHER EXTRACTION (%)
13	6	III	+	12.52
26	?	III	+	
45	2½	III	+	9.74
5	0	IV	+	15.60
29	0	IV	+	
31	0	IV	+	
52	0	IV	+	10.23
61	0	IV	+	12.90
169	0	IV	+	7.93
6	3	V	0	
11	0	V	+	
12	0	V	+	
17	2	V	+	4.53
22	0	V	+	
24	0	V	+	
40	0	V	+	5.10
51	0	V	+	11.42
1	0	VI	+	
30	0	VI	+	
35	4	VI	0	12.69
37	5	VI	+	14.93
43	3½	VI	0	
55	2	VI	+	
59	1½	VI	+	13.21
84	2	VI	+	12.95
87	3	VI (muddy)	+	12.04
92	6	VI	+	7.96
98	1	VI	0	
101	3½	VI (muddy)	+	13.45
110	1½	VI	+	7.81
128	4	VI	+	6.35
172	3	VI	+	
8	2	VII	+	11.35
14	0	VII	+	
27	?	VII	+	10.50
63	0	VII	0	14.57
64	0	VII	+	
73	2	VII (muddy)	+	15.51
76	1	VII	+	19.71
94	3	VII	0	
96	2	VII	0	10.22
97	2½	VII	+	12.93
114	2	VII	+	11.86
117	4	VII	+	
118	0	VII	+	13.32
119	2½	VII	+	9.48
126	7	VII	+	13.06
136	2	VII (muddy)	+	7.18
139	0	VII	+	10.87
160	0	VII	+	19.45
175	2	VII	0	
2	0	VIII	+	
36	5	VIII	+	
68	1½	VIII	+	

TABLE II.—Continued

81	3	VIII	+	+	+					
91	3	VIII	+							
106	7	VIII	+	+	+	+	+	+	+	17.90
121	0	VIII	+	+	+	+	+	+	+	13.06
122	5½	VIII	+	+	+					7.72
125	4	VIII	+	+						8.60
129	2	VIII	+							
144	2½	VIII	+	+	+					9.56
157	0	VIII	+	+	+	+	+			14.83
161	3	VIII	+	+	+	+				12.10
165	1½	VIII	+	+	+					
167	0	VIII	+	+	+	+	+			11.20
20	2	IX	+							
54	2	IX	+	+	+					9.31
74	1½	IX	+	+	+					16.55
82	1½	IX	+	+						14.70
90	4	IX	+	+	+					
99	7	IX	+	+	+					21.13
131	0	IX	+	+	+	+	+			
133	5	IX	+	+						8.98
135	0	IX	+	+	+					8.67
142	0	IX	+	+	+	+				14.48
143	4	IX	+	+	+					6.21
153	1	IX	+	+	+					10.21
155	0	IX	+	+	+	+	+	+	+	
158	0	IX	+	+	+	+	+	+		13.52
159	4	IX	+	+	+	+				7.94
166	4	IX	+	+	+	+				9.20
7	0	X	+	+	+					
10	0	X	+	+	+	+	+	+	+	
25	0	X	+	+	+					
34	0	X	+	+	+					
60	0	X	+	+	+	+	+	+		
72	0	X	+	+	+	+	+	+	+	
75	0	X	+	+	+					
83	0	X	+	+	+	+	+			
104	0	X	+	+	+	+				
123	0	X	+	+	+	+	+			
150	3	X	+	+	+	+	+			13.88 (cystic)
170	2	X	+	+						

corpora lutea. Even a corpus luteum having so little pigment as to be grouped under color III contained the maximum amount of fat, as indicated by being stained with Sudan III. Among the corpora lutea grouped under color IV we have one containing but a trace of fat, while in the same group are others containing a large amount. In each of the other groups, with the possible exception of group X, this same condition is found. Even in group X we have corpora lutea varying in fat content from just above the minimum almost up to the maximum. Where there is so little uniformity we must conclude that there is no direct relationship between the color and the amount of fat present.

As previously mentioned, Palmer¹ reported that he had been unable to identify carotin in the corpora lutea of swine, so it was thought desirable to determine if fat were present in these tissues. Ovaries were obtained from sows on the killing-floor of the abattoir and were subjected to the same treatment as were those from cattle. It was found that the color of the corpora lutea from swine ovaries was uniformly a pinkish gray, about the color of veal steak, and could not be classified according to the color-chart. When sectioned on the freezing microtome and stained with Oil Red O and Nile Blue sulphate, respectively, the presence of fat was readily demonstrated. Figure 3 is a photomicrograph of such a section from the corpus luteum of sow 200.

DETERMINATION OF AMOUNT OF FAT IN CORPORA LUTEA BY ETHER EXTRACTION

That the determination of the amount of fat in tissue by the use of a fat stain, as Sudan III, etc., was not wholly satisfactory was indicated by the fact that when sections of vestiges which were color X or darker were sectioned on the freezing microtome and one section stained with Sudan III, one left unstained, and both mounted and examined under the microscope, the stained section could not be distinguished from the one which was not stained. (See figures 4 and 5.) From this it would appear that, where a section is highly pigmented, the amount of fat can not be accurately determined by staining alone. For that reason 77 corpora lutea which represented the different color groups were selected and were extracted with ether using the following technic:

The corpora lutea were removed from the ovaries which had been preserved in 10 per cent formalin for several months. All the connective tissue was removed from the surface and the material finely triturated in a watch-glass. The samples were then placed in a drying-oven, which was kept at 50° C. for several hours or until they were completely dried. After drying, the samples were weighed and placed in alundum thimbles and were extracted for 16 hours in Soxhlet extraction flasks, using redistilled ether. The weight of the collection flasks was determined before extraction was begun. At the end of 16 hours, the collection flasks were removed from the apparatus, the excess ether was evaporated, and the flasks were then placed in the drying-oven at 98° C. for 24 hours. At the end of this time, and after cooling to room temperature, the flasks were again weighed and the increase in weight was recorded as the weight of the ether extract. The flasks were then placed in a desiccator over calcium chlorid until needed for the next extraction.

The Soxhlet apparatus used consisted of five complete units. Four samples were run simultaneously each time a determination was made, the fifth Soxhlet being used as a control on the amount of solids present in the ether used for extraction purposes. At each determination the same volume of ether was introduced into the control flask as was used in the flasks in which determinations were being made and this ether was all

taken from the same stock lot. Thus the increase in the weight of the control flask could be considered to be due to the solids in the ether and this was taken into consideration in calculating the percentage of ether extract in the samples of corpora lutea which were concurrently analyzed.

Because of the very small amount of material available it was not possible to run the analyses in duplicate. For that reason a relatively large number of extractions were made.

Table III gives the results obtained in the determination of ether extract on those samples for which 0.5 gm. or more of dried material was available. In addition to the 29 samples

TABLE III—*Fat determination of corpora lutea by ether extraction*

ANIMAL	MONTHS PREGNANT	COLOR OF CORPUS LUTEUM	GRAMS EXTRACTED	NET GRAMS ETHER EXTRACT	PER CENT ETHER EXTRACT
167	0	VIII	.700	.0785	11.2
126	7	VII	.500	.0653	13.06
118	0	VII	.500	.0666	13.32
133	5	IX	.700	.0629	8.98
171	1½	VII	.700	.046	6.57
166	4	IX	.630	.058	9.2
145	0	IX	.500	.0405	8.1
125	4	VIII	.500	.043	8.6
139	0	VII	.514	.0559	10.87
150	3	X	.5443	.0754	13.85
142	0	IX	.6048	.0876	14.48
172	3	VI	.5685	.034	5.98
120	6½	VI	.5749	.0879	15.29
143	4	IX	.5838	.0363	6.21
173	4½	VI	.9111	.0579	6.35
135	0	IX	.5813	.0504	8.67
124	2½	VIII	.5153	.0258	5.39
122	5½	VIII	.5124	.0396	7.72
161	3	VIII	.7105	.0860	12.10
130	7½	VI	.6085	.0693	11.10
164	0	IX	.6825	.1122	16.44
158	0	IX	.6368	.0861	13.52
139	0	VII	.5957	.0673	11.29
136	2	VII	1.076	.0773	7.18
160	0	VII	.5458	.1062	19.45
153	1	IX	.5083	.0519	10.21
119	2½	VII	.6285	.0596	9.48
128	4	VI	.6590	.0515	7.81
162	4	VI	.6422	.0874	13.60

for which the amount of ether extract is recorded in the table there were 48 others extracted. Where the amount of dried material available for extraction was less than 0.5 gm. and the chance for error thus was comparatively greater, the data secured have not been tabulated; however, the percentage of ether extract in the smaller samples of corpora lutea showed no greater variation than in those where larger amounts of material were available.

An analysis of table III shows that the percentage of ether extract ranged from a minimum of 5.39 per cent in the corpus luteum of animal 124, a cow that had been pregnant two and one-half months, the color of which was VIII, to a maximum of 19.45 per cent in the corpus luteum from animal 160, a non-pregnant animal, the color of which was VII. The average amount of ether extract of the 29 extractions recorded in table III was 10.56 per cent.

This table further shows that there is no direct relationship between the color and the fat content of corpora lutea. The corpus luteum containing the least amount of ether extract was VIII in color, while the corpora lutea containing the largest amount of ether extract (animal 160) were color VII. Six corpora lutea, each of color VI, were extracted and the following amounts of ether extract obtained: 172, 5.98 per cent; 120, 15.29 per cent; 173, 6.35 per cent; 130, 11.39 per cent; 128, 7.81 per cent; and 162, 13.60 per cent. The corpora lutea of color VIII gave percentages of ether extract as follows: 167, 11.2 per cent; 125, 8.60 per cent; 124, 5.39 per cent; 122, 7.72 per cent; and 161, 12.10 per cent. Such marked variation in the content of ether extract of corpora lutea having the same color shows that no direct relationship exists between the two.

Table IV shows that there is perhaps less variation in the amount of fat present in the animals which are non-pregnant than those in the several stages of gestation. The animals in group 2, those in early pregnancy, show less variation in the amount of fat than any other group and the percentage of fat is higher than in groups 3 and 4. Groups 3 shows much more variation in the amount of fat present in the corpora lutea than any other group. In spite of the fact that these data represent so few animals, the findings of Tricomi⁴ are confirmed, in a general way. He found that the amount of fat increased up to about the fifth month of pregnancy, when it decreased, to increase again toward the end of the gestation period.

It had been suggested that perhaps the corpora lutea from the ovaries of cows of certain breeds might be more highly pigmented than those from cows of other breeds; that highly colored corpora lutea might be characteristic of some breeds and not of others. It is a well-known fact that the skin of certain breeds contains much more yellow pigment than that of other breeds. In order to determine if highly pigmented corpora lutea were character-

TABLE IV—Color and fat content of corpora lutea. Animals grouped according to state of pregnancy

ANIMAL	MONTHS PREGNANT	COLOR OF CORPUS LUTEUM	FAT CONTENT AS DETERMINED	
			By Staining with Sudan III	By Ether Extraction (%)
1. Animals non-pregnant				
118	0	VII	+ + + + +	13.32
135	0	IX	+ + +	8.67
139	0	VII	+ + + + +	10.87
142	0	IX	+ + + + +	14.48
145	0	IX	+ + + + +	8.10
158	0	IX	+ + + + +	13.52
160	0	VII	+ + + + +	19.45
164	0	IX	+ + + + +	16.41
167	0	VIII	+ + + + +	11.20
			Average	13.00
2. Animals pregnant not over 2 months.				
136	2	VII (muddy)	+ +	7.18
153	1	IX	+ + +	10.23
171	1½	VII	+ + +	6.57
			Average	7.99
3. Animals pregnant between 2 and 4 months.				
119	2½	VII	+	9.48
124	2½	VIII	+ + +	5.39
125	4	VIII	+ +	8.60
128	4	VI	+ +	7.81
143	4	IX	+ +	6.21
150	3	X	+ + + + +	13.88
161	3	VIII	+ + + + +	12.10
162	4	VI	+ + + + +	13.60
166	4	IX	+ + + + +	9.20
172	3	VI	+	5.98
			Average	9.23
4. Animals pregnant between 4 and 6 months.				
122	5½	VIII	+ + +	7.72
133	5	IX	+ +	8.98
173	4½	VI	+	6.35
			Average	7.68
5. Animals pregnant between 6 and 9 months.				
120	6½	VI	+ + + + +	12.28
126	7	VII	+ + + + +	13.06
130	7½	VI	+ + +	11.39
			Average	13.24

istic of certain breeds, the animals of each breed were grouped together in table V.

With so few animals of some of the breeds represented in table V, it is not possible to draw definite conclusions. However, it does indicate that high pigmentation is not a breed characteristic. The corpora lutea from the three Guernsey cows were color IX, but there were also Jerseys, Shorthorns, and a Holstein-

TABLE V—Color and fat content of corpora lutea. Animals grouped according to breed

ANIMAL	BREED	MONTHS PREG- NANT	COLOR OF CORPUS LUTEUM	FAT CONTENT AS DETERMINED	
				BY STAINING WITH SUDAN III	BY ETHER EXTRAC- TION (%)
118	Holstein F.	0	VII	+++ +	13.32
167	Holstein F.	0	VIII	+++ +	11.20
171	Holstein F.	1½	VII	+++	6.57
173	Holstein F.	4½	VI	+	6.35
126	Holstein-Hereford	7	VII	+++ +	13.06
139	Holstein-Hereford	0	VII	+++ +	11.39
143	Holstein-Hereford	4	IX	++	6.21
150	Holstein-Jersey	3	X(cystic)	+++ +	13.88
119	Hereford	2½	VII	+	9.48
125	Hereford	4	VIII	++	8.60
128	Hereford	4	VI	++	7.81
130	Hereford	7½	VI(muddy)	++	11.39
120	Shorthorn	6½	VI	+++ +	15.28
122	Shorthorn	5½	VIII	+++	7.72
124	Shorthorn	2½	VIII	+++	5.39
142	Shorthorn	0	IX	+++ +	14.48
145	Shorthorn	0	IX	+++ +	8.10
158	Shorthorn	0	IX	+++ +	13.52
133	Jersey	5	IX	++	8.98
135	Jersey	0	IX	+++	8.67
136	Jersey	2	VII	++	7.18
160	Jersey	0	VII	+++ +	19.45
162	Jersey	4	VI	+++ +	13.60
172	Jersey-Shorthorn	3	VI	+	5.98
153	Guernsey	1	IX	+++	10.21
164	Guernsey	0	IX(cystic)	+++ +	16.41
166	Guernsey	4	IX	+++ +	9.20

Hereford with corpora lutea IX in color. The corpora lutea from Jersey cows varied from IV to IX. The most highly pigmented corpus luteum was X and came from animal 160, a Holstein-Jersey.

ACTION OF ALCOHOL UPON CORPORA LUTEA

In work which is not herein reported, a large number of the corpora lutea were imbedded in celloidin or paraffin and in the process of dehydration it was found that there was considerable

variation between different corpora lutea in the way they were acted upon by the different concentrations of alcohol.

In some instances in dilute alcohol there was evidence that either fat or pigment or possibly both were extracted. Others showed no evidence of this. No attempt was made to determine if it was fat or pigment which was extracted. A yellowish discoloration of the alcohol was taken as evidence that extraction had occurred. By consulting table VI it would appear that both were extracted. Corpus luteum 24 (color V) and corpus luteum 61 (color IV) showed extraction in 95 per cent and in absolute alcohol in twenty-four hours. Both of these were found to contain a large amount of fat when frozen sections were stained with Sudan III. This would indicate that in these two instances fat was extracted, both of these being so low in pigment. That in other instances pigment was largely the material extracted is indicated in the case of corpus luteum 75 (color X). This corpus showed marked extraction in alcohol while upon staining frozen sections with Sudan III it was found to contain but a small amount of fat. Corpus luteum 104 (color X) showed marked extraction in all-concentrations of alcohol. When frozen sections of this corpus luteum were stained with Sudan III it was found to contain a large amount of fat. In this instance then, the material extracted was in all probability a mixture of pigment and fat.

Table VI shows the corpora lutea from which extraction occurred in the different concentrations of alcohol, their color according to our color-chart, and their fat content as indicated by staining frozen sections of the same corpora lutea with Sudan III.

When it was observed that fat or pigment was extracted from some of the corpora lutea and none from others it was thought that perhaps that where extraction occurred it might be an indication of the amount of fat present. The data gathered from table VI do not bear this out. For example, corpus luteum 53 (color VI) showed extraction in 95 per cent alcohol and in absolute alcohol, both in 12 and 24 hours. Yet upon being stained with Sudan III this corpus showed but a very small amount of fat. Corpus luteum 58 (same color as 53) which showed a marked amount of extraction in absolute alcohol also was found to contain but a small amount of fat when stained. On the other hand, corpus luteum 77 which showed slight extraction in 80 per cent, positive in 95 per cent, and marked in absolute alcohol,

was shown to contain a large amount of fat when stained with Sudan III. Likewise corpus luteum 104 (color X) showed marked extraction in 95 per cent alcohol and in 12 and 24 hours

TABLE VI—Sections from which fat, apparently, was extracted by different concentrations of alcohol

CORPUS LUTEUM FROM ANIMAL NO.	80% (24 HRS.)	95% (24 HRS.)	ABSOLUTE (24 HRS.)	COLOR OF CORPUS LUTEUM	FAT CONTENT AS DETERMINED BY STAINING WITH SUDAN III
24		+	+	V	+
49		+	+	VII	+
50		+	Slight	VII	+
54		+	+	IX	+
57		+	+	Muddy	+
58		+	+	VI	0
60		+	+	X	+
61		Sl.	+	IV	+
63		Sl.		VII	0
64		+	+	VII	+
75		+	+	X	+
76	Sl.	Sl.	+	VII	+
77	Sl.	+	+	VII	+
79	Sl.	+	+	IX	+
80	Sl.	+	Sl.	IX	+
81	Sl.	+	+	VIII	+
82	Sl.	+	+	IX	+
83	Sl.	+	+	X	+
84	+	Sl.	+	VI	+
85	Sl.	+	+	IX	+
87		+	Sl.	VI	+
88	Sl.	+	+	VIII	+
89	Sl.	+	Sl.	VIII	+
90	Sl.	+	Sl.	IX	+
91	Sl.	Sl.	+	VIII	+
92		Sl.		VI	+
93		Sl.		VII	+
95	Sl.	+	+	VI	+
96		+	Sl.	VII	0
97	Sl.	+	+	VII	+
99		Sl.		IX	+
100		Sl.	Sl.	VIII	+
101		+	+	VI	+
102		+	+	VII	+
104		+	+	X	+
105		+	Sl.	IX	+
106		Sl.		VIII	+
108	Sl.	+	+	VIII	+
109		+	+	VIII	+
110	Sl.	+	+	VI	+
111		+	+	VII	+
116		+	+	VI	+

in absolute alcohol was shown to contain a relatively large amount of fat upon being stained.

It was concluded, therefore, that the amount of extraction which occurred in different concentrations of alcohol in the process

of imbedding could not be depended upon as an index of the amount of fat present.

LIPOID CONTENT IN PARAFFIN-IMBEDDED SECTIONS

We found, as did Elder,⁸ that in the process of imbedding sections of corpora lutea in paraffin the lipoid was dissolved out, leaving open spaces where the globules of fat had been.

Long and Evans⁹ reported on the use of a method, a modified Meves and Duesberg method, which they had used in imbedding corpora lutea from rats, in which the lipoid remained *in situ* and was not removed by the different reagents used in the process of imbedding. Their method of imbedding was as follows:

Ovaries were fixed in Benda's fluid for 48 hours, rinsed with distilled water and placed in a solution consisting of equal parts of 1% chromic acid, and pyroligneous acid for 48 hours, rinsed again with distilled water and transferred to 2% aqueous solution of potassium bichromate for 48 hours. After this it is washed for from 12-24 hours in distilled water, dehydrated, cleared from 2-4 hours in cedar oil, transferred to xylol and imbedded in paraffin.

With their rat tissue they found that, after being treated in this manner when sectioned, mounted on slides and examined with the oil-immersion lens, the fat globules showed up sufficiently for examination.

This method was tried on 40 corpora lutea from bovine ovaries. The tissues were passed from 95 per cent alcohol to carbol-xylol instead of being cleared with cedar oil. Passing directly from carbol-xylol to xylol saturated with 43° paraffin, then into 43° paraffin, two changes, then into 55° paraffin and blocked.

Sections imbedded in this manner were cut at 7 microns but upon being examined unstained, the lipoids did not show up as black globules, as reported by Long and Evans, and it was feared that some mistake had been made in the technic. However, it was noticed that those sections that had been shown, by being stained as frozen sections with Sudan III, to have contained large fat globules did not show the open spaces which the same sections had shown when imbedded in the regular way in paraffin.

For that reason the thought suggested itself that perhaps the lipoid was there and would take the characteristic stain if treated with Sudan III. This was tried and found to be true. Such sections were stained with Sudan III, Oil Red O, and Nile Blue sulphate and of those stained with the latter stain photomicrographs were successfully made.

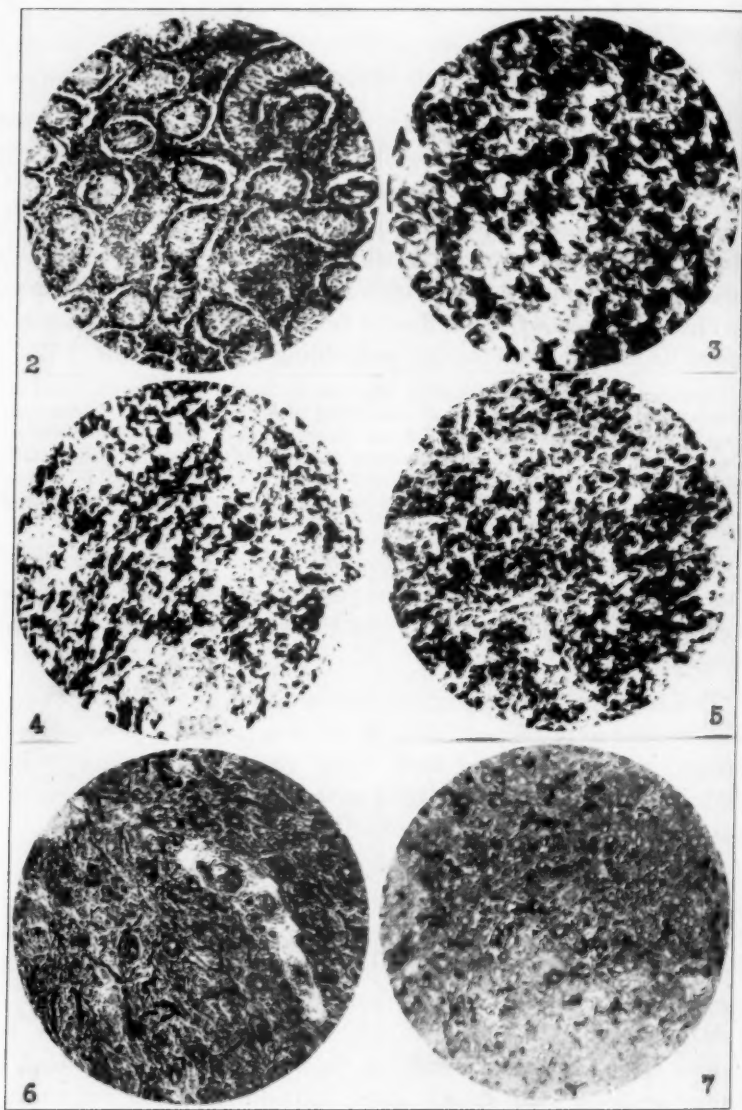


FIG. 2. Testicular tissue from animal 12.

FIG. 3. Corpus luteum (suis) from animal 200 (frozen section). Stain: Nile Blue sulphate; G. filter; low power; fat granules are black.

FIG. 4. Corpus luteum (vestige X) from animal 193 (frozen section). Stain: Oil Red O and hematoxylin; B. filter. Black granules are fat or pigment or a mixture of these.

FIG. 5. Corpus luteum (vestige X) from animal 193 (frozen section). Stain: Hematoxylin; B. Filter. Black granules are pigment or a mixture of fat and pigment.

FIG. 6. Corpus luteum from animal 119 (low power). Section showing very little fat, which shows as small black granules.

FIG. 7. Corpus luteum from animal 144 (low power). A section showing only a small amount of fat. Fat granules are deep black and very small.

It was suggested that perhaps there is enough difference between the character of the lipoid present in the rat corpus luteum and that in the bovine that the one would be turned black and the other not. Whatever the cause, the fat globules were retained in the tissues, were not dissolved out by the alcohol or carbol-xylol, and could be demonstrated by being stained with fat stains, and the fat demonstrated in photomicrographs.

PHOTOMICROGRAPHS

With the exceptions of figures 1 to 6, the accompanying photomicrographs were taken of sections of corpora lutea which had been imbedded in paraffin after the method recommended by Long and Evans.⁹ Nile Blue sulphate was the stain used, and the preparations were not rendered alkaline.

The section shown in figure 2 was imbedded in paraffin in the usual manner and stained with hematoxylin and eosin. Those shown in figures 3, 4 and 5 were made from frozen sections. Figure 3 was stained with Nile Blue sulphate while figure 4 was stained with Oil Red O and hematoxylin, and figure 5 was stained with hematoxylin alone.

Special attention should be called to figures 4 and 5. As has been noted, a frozen section of a red vestige when examined under the microscope can not be distinguished from a similar section which had been stained with Sudan III, and the same is true when Oil Red O is used instead of Sudan III. The tissue shown in figure 4 was stained with Oil Red O and hematoxylin and this preparation could not be distinguished from the preparation shown in figure 5 of the same tissue, which had been stained with hematoxylin alone.

In making all of the photographs, the same microscope, with the same objective and ocular, was used and the camera in all cases was so adjusted that the photographic plate was 47 cm. above the bottom of the tube of the microscope. For the low-power photographs a 16-mm. objective and a 10x hyperplane ocular were used and for the high power photographs, the 4-mm. objective was used with the same ocular. By proceeding in this manner the magnification of all low-power and of all high-power photomicrographs is exactly the same. The magnification was measured directly by placing a Zeiss "objectmikrometer" on the stage of the microscope and obtaining a reading of the image on the ground glass of the camera against a millimeter rule. It

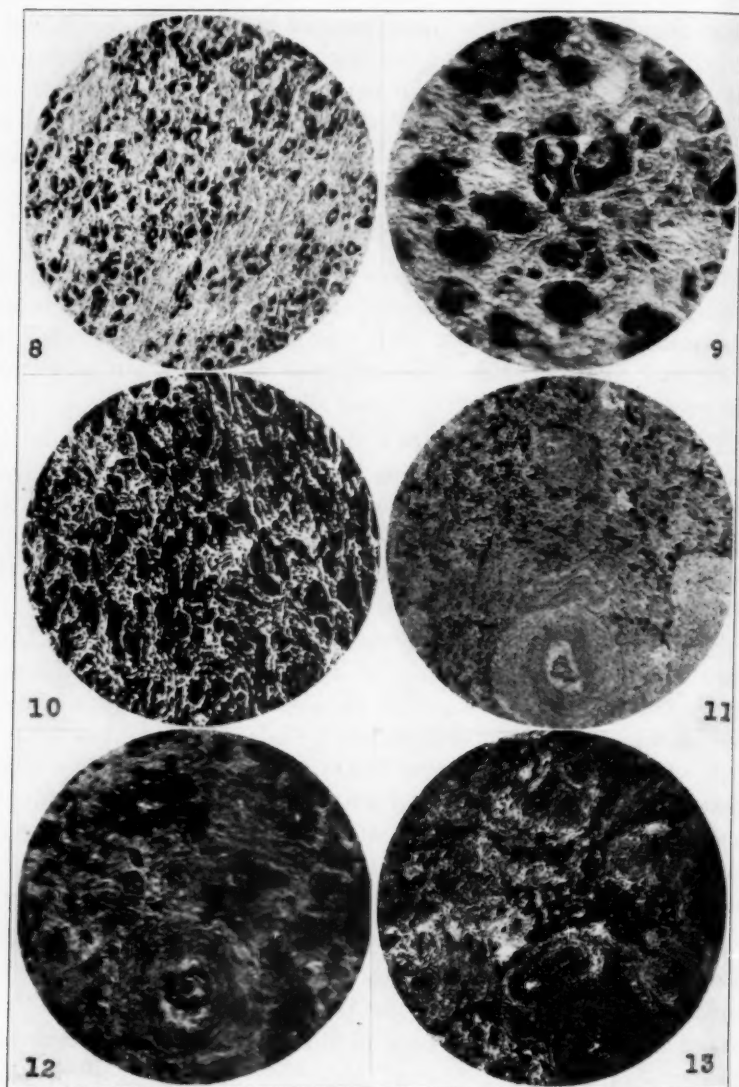


FIG. 8. Corpus luteum from animal 65 (low power). A section showing a relatively large amount of fat.

FIG. 9. Same as figure 8 (high power).

FIG. 10. Corpus luteum from animal 141 (low power). A section showing large fat globules.

FIG. 11. Corpus luteum from animal 170 (low power). A section showing a relatively large amount of fat and, in addition, many blood-vessels.

FIG. 12. Same as figure 11 (high power).

FIG. 13. Corpus luteum from animal 7 (low power). A section where the majority of the fat globules were collected in groups or nests.

was found that the 16-mm. objective gave a magnification of 111.1x and the 4-mm. objective 511.1x.

SUMMARY AND CONCLUSIONS

The corpora lutea were graded as to pigmentation from gross section after fixation for 48 hours in 10 per cent formalin. Micro-sections were prepared in all cases and stained with Sudan III, when their relative fat content was determined microscopically. In 77 representative samples the fat content was also determined by the Soxhlet method.

A number of swine corpora lutea also were included in these studies.

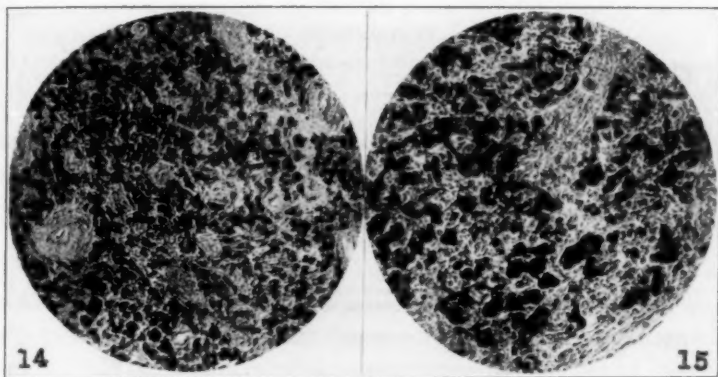


Fig. 14. Corpus luteum (vestige) from animal 145. A section in which there is a large amount of fat in small granules.

Fig. 15. Corpus luteum from animal 123 (low power). A section showing a large amount of fat in large granules. (Magnification exactly the same as in figure 14).

Comparisons were made of the degree of pigmentation of corpora lutea in the fresh state and after fixation comparisons were made also of Nile Blue Sulphate, Oil Red O, and Scharlach R as stains for the study of corpora lutea.

The data as recorded and tabulated are herein presented.

Forty representative samples were imbedded in paraffin by the method of Long and Evans and photomicrographs were made.

The color-chart, which was established for grouping bovine corpora lutea according to the intensity of pigmentation, was found applicable in 181 such structures out of the total of 194 studied. Swine corpora lutea could not be classified according to this chart.

It was found that the degree of pigmentation of corpora lutea does not run parallel with the amount of fat contained as determined by sectioning and staining with Sudan III or as determined by extraction by the Soxhlet method.

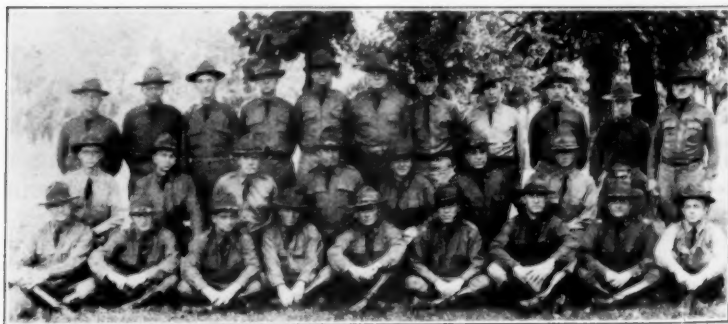
Moreover, it was determined that there is no relationship between pregnancy, the stage of gestation, or the breed of the animal and pigmentation or fat content of corpora lutea.

ACKNOWLEDGMENT

The writer is greatly indebted to Dr. L. W. Goss, Professor of Veterinary Pathology, College of Veterinary Medicine, Ohio State University, for valuable suggestions and assistance in conducting the work as herein reported.

REFERENCES

- ¹Palmer, L. S.: Carotinoids and Related Pigments. Monograph (Chemical Catalog Company, New York).
- ²Escher, H. H.: Ueber den farbstoff des corpus luteum. Zeit. Physiol. Chem., lxxxiii (1913), pp. 189-211.
- ³Thatcher, R. W.: Chemistry of Plant Life (McGraw-Hill Book Company).
- ⁴Tricomi, E.: Lipoid metabolism of corpus luteum. Riformi Med. (Napoli), xxxvii (1921), p. 762. Abs. in Jour. Endocrin., vii (1922), no. 4.
- ⁵Von Mikulicz-Radecki: The lipoids in the human ovary. Deut. Med. Wchnschr., xlvii. (1922), pp. 1192-1193. Abs. in Jour. Endocrin., vii (1923), p. 832.
- ⁶Fenger, F.: Phosphatids in ductless glands. Jour. Biol. Chem., xxvii (1911), p. 303.
- ⁷McNutt, G. W.: The corpus luteum of the ox ovary in relation to the estrous cycle. Jour. A. V. M. A., lxxv (1924), n. s. 18 (5), pp. 556-597.
- ⁸Elder, C.: Studies of the corpus luteum. Jour. A. V. M. A., lxxvii (1925), n. s. 20 (3), pp. 349-363.
- ⁹Long, J. A., & Evans, H. McL.: The Oestrous Cycle of the Rat and Its Associated Phenomena. Memoirs of the University of California, vi (University of California Press, Berkeley, Calif.).
- ¹⁰French, R. W.: Fat stains. Stain Technology, i (1926), 2, p. 79.



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THE TOXICITY OF TREMETOL*

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Washington, D. C.*

In a recent publication,¹ dealing with the etiology of trembles and milk sickness, it was shown that the only constituent of richweed or white snakeroot (*Eupatorium urticaefolium*) that could be considered responsible for the poisoning is tremetol, an optically active liquid compound. Final proof of the production of trembles by tremetol was delayed, owing to the small quantity of that substance available. A larger quantity has since been prepared and this, tested on a sheep, has caused the characteristic syndrome known as trembles.

Experiments on sheep have been made, using tremetol prepared from plants collected at different times and in different places. These have shown that the dose of pure tremetol necessary to produce trembles is higher than the dose of the plant calculated on a basis of tremetol content. This may be due to the manner in which the tremetol has been administered or it may be due to losses of material incidental to extraction and purification. In the latter case the figures for plant equivalent calculated from the weight of tremetol fed would be larger than they should be. The well-known fact must be borne in mind that many toxic constituents of plants are more actively poisonous in their natural condition in the plant than they are when isolated and purified. This does not necessarily indicate an alteration of the toxic substances, but may mean that they are more readily absorbed from the gastro-intestinal tract or are protected from some detoxicating action of the digestive juices. Tremetol is an easily altered compound but nothing is known about the conditions which obtain when it is introduced into the digestive tract.

Tremetol is a cumulative poison and the experimental feedings were made in several successive doses given one a day. This plan was adopted in the feedings with extracts that have been previously reported and was found satisfactory. There appears, however, to be a certain minimal dose required for the production of trembles and if less than that amount be given

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no effect or, at most, only slight symptoms are observed. This idea serves to explain some facts in the feedings with extracts and may explain the failure to produce trembles in two of the cases cited below.

Case 1: Sheep 782, a ewe that weighed 105 pounds was drenched with an emulsion of 0.5 gm. of tremetol in syrup of acacia every day from June 18 to June 21, 1924, a total of four doses. The animal showed nothing abnormal. The tremetol used in this feeding had been obtained by prolonged steam distillation of an active extract and it was thought at the time that the process had detoxicated it. In the light of what we now know it is probable that the dose was much below the minimal toxic limit.

Case 2: Sheep 6, a yearling ewe that weighed 83 pounds, was given a series of doses of pure tremetol emulsified in syrup of acacia. The tremetol used had been prepared from green richweed collected at Beecher City, Illinois, in 1925, and was of the highest purity. During the feeding two samples of blood were drawn each week-day and the content of sugar was determined (chart 1). Table I shows the doses given and the approximate

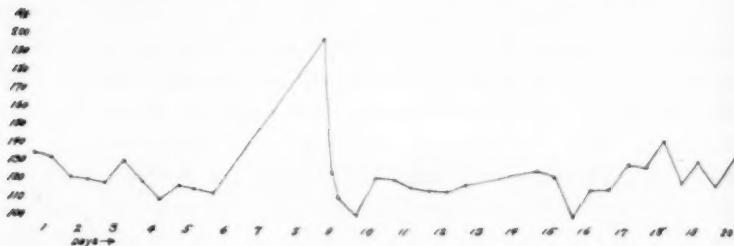


CHART 1. Blood-sugar curve of sheep 6, from Aug. 30 to Sept. 19, 1926. (Blood sugar in mg. per 100 cc plotted against time in days.)

weight of green plant per hundredweight of sheep represented by them.

On September 8 the supply of tremetol was exhausted and feedings were discontinued. The animal was kept under observation, however, and blood samples were obtained until September 19. From the 8th to the 13th of that month the animal was markedly depressed and walked with the awkward gait characteristic of sheep in the early stages of richweed poisoning. Some trembling of the shoulder muscle was observed which was most prominent from the 9th to the 13th. At no time did the sheep show the characteristic syndrome of trembles. There

was no odor of acetone on the exhaled air and no evidence of ketosis was obtained by analyses of blood and urine.

Table I—Experimental feeding of tremetol to sheep in 1926

DATE	DOSE (GM.)	PLANT EQUIVALENT (POUNDS PER 100)	EFFECTS
Aug. 30	0.5	0.875	None
Aug. 31	0.7	1.225	None
Sept. 1	1.0	1.75	Depressed
Sept. 2	1.0	1.75	Depressed
Sept. 3	2.5	4.375	Trembles gait
Sept. 7	2.5	4.375	Trembles gait
Sept. 8	3.0	5.255	Slight trembling
Totals	11.2	19.605	

The blood-sugar curve is represented in chart 1. This presents no abnormality except for the very high level observed on the morning of September 7, after the sheep had been rested for three days. As the level fell rapidly during the 7th, it was concluded that the event was not a result of the feeding but was due to some other cause.

Case 3: Sheep 8, a yearling ewe that weighed 88.5 pounds on December 7, 1927, was given daily doses of pure tremetol emulsified in syrup of acacia until symptoms appeared. The feedings were discontinued for four days and then another dose was given. A sample of blood was drawn each morning before the sheep was given the tremetol and was used for determination of blood sugar and acetone test. Table II shows the doses given, the equivalent of green plant calculated to pounds per hundredweight of sheep, the blood-sugar content, and the observed condition of the animal. The blood-sugar curve is represented in chart 2.

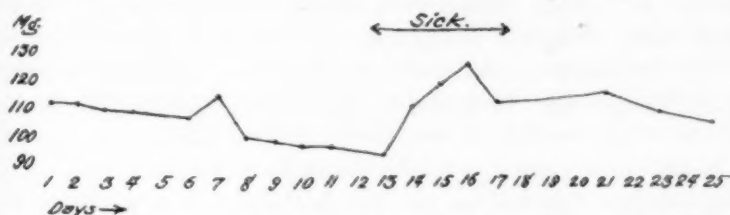


CHART 2. Blood-sugar curve of sheep 8, from Dec. 7 to 31, 1927. (The vinculum indicates the period during which the sheep was very sick.)

The sheep presented a characteristic case of trembles. During the height of the poisoning, on December 20, 21, and 22, the animal was lying down most of the time and was unable to stand

Table II—*Experimental feed of tremetol to sheep 8 in 1927*

DATE	DOSE (GM.)	PLANT EQUIVALENT (POUNDS PER 100)	BLOOD SUGAR (MG. PER 100 CC)	EFFECT
Dec. 7	1.0	1.75	113.4	Normal
8	1.0	1.75	113.6	Normal
9	1.0	1.75	111.3	Normal
10	1.0	1.75	110.3	Normal
12	2.0	3.5	109.2	Not normal
13	2.0	3.5	116.9	Not normal
14	2.0	3.5	102.	Not normal
15	3.0	5.25	101.1	Not normal
16	—	—	99.2	Symptoms
17	—	—	99.3	Trembles gait
19	3.0	5.25	96.1	Trembles gait
20	—	—	112.7	Depressed
21	—	—	120.7	Trembles
22	—	—	128.7	Trembles
23	—	—	114.4	Stronger
27	—	—	117.9	Recovering
29	—	—	110.3	Nearly normal
31	—	—	107.5	Normal
Totals	16.0	28.0		

at one period of several hours. She walked with the typical "trembles" gait and after exercise or exertion would assume the trembles position with the four legs placed well under the body and the back arched and then exhibit violent trembling of the shoulder, flank, croup, and thigh muscles. After the 23rd she made a rapid recovery and was normal by December 31.

The blood-sugar curve shows an interesting relationship. The amount of dextrose in the blood decreased steadily following the feedings except for a transitory increase on the 7th day (December 13), until December 19, when the sheep began to show marked symptoms of incipient richweed poisoning. Then the blood sugar increased sharply for the following three days, the period during which the sheep was very sick. The curve began to descend as the sheep started to recover and during the following week reached an essentially normal figure.

In this case there was no development of ketosis. At no time was acetone detected on the exhaled air or in the blood and urine. The fact that a well-marked, but non-fatal, case of trembles can be produced without the appearance of ketosis confirms the writer's earlier suggestion² that the ketosis is a result of the poisoning and not a cause. The development of ketosis with acetonuria is, however, a serious complication of

the disease and likely to lead to fatal results. It is possibly the chief factor in producing the deaths of trembles animals, since the most successful treatments of richweed poisoning are those designed to remedy "acidosis." If the ketosis can be eliminated, the prognosis is very good.

The data here presented considered in relation to those already published leave no reasonable doubt that the toxic constituent of richweed that is responsible for trembles and milk sickness is tremetol.

The writer wishes to take this opportunity to express his appreciation of the generous assistance given by Prof. A. A. Hansen and Prof. H. S. Jackson, in the collection of plants at Lafayette, Indiana; to Dr. L. T. Giltner, who took the samples of blood from sheep 8, and to Dr. John S. Buckley, for unfailing encouragement and support throughout the entire investigation.

REFERENCES

¹The toxic constituent of richweed or white snakeroot (*Eupatorium urticaefolium*). Jour. Agr. Res., 35 (1927), pp. 547-576.

²Acidosis, trembles, and milk sickness. Science, n. s. 64 (1926), pp. 456-457.

NEWS ITEMS

A grant of \$200 has been made by the Provincial Department of Agriculture to the Veterinary Association of Manitoba.

At the request of Dr. F. H. Brown, state veterinarian of Indiana, Attorney Arthur L. Gillian recently ruled that county commissioners can not pay more than \$1500 as the annual salary of veterinarians engaged in tuberculosis eradication work. The ruling stated that veterinarians may be reimbursed for actual expenses incurred in connection with the work.

Officials of River Forest, Ill., have repealed the local ordinance, making the vaccination of dogs against rabies compulsory. It is reported that this action was taken because a local physician presented evidence to show that the antirabic vaccination is not 100 per cent effective.

The Delaware State Board of Agriculture recently found it necessary to adopt very stringent regulations to prevent the spread of anthrax in Kent County. The regulations provide for the immediate burial of carcasses of cattle dying of the disease and the removal of the hides is prohibited. A penalty of \$100 fine, or imprisonment for one month, or both, is provided.

THE ANTIGENIC RELATIONSHIP OF BACTERIUM PULLORUM, BACTERIUM GALLINARIUM AND BACILLUS AERTRYCKE (B. PESTIS CAVIAE)

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Considering the amount of research which has been devoted to various members of the typhoid-enteritidis group, it appears unlikely that *Bact. pullorum*, *Bact. gallinarium*, and *B. aertrycke* have not been included in the same antigenic studies. If such is the case, the results of such studies have received but little consideration.

A possible similarity in the antigenic properties of these three organisms was brought to the writer's attention while studying the antigenic properties of *Bact. pullorum* and *Bact. gallinarium*. In these studies the complement-fixation test was used, and in testing for anticomplementary action of the antigens, the complement was found to be fixed in the absence of an immune serum. The source of the complement was found to be a guinea pig that was infected with an organism resembling *B. aertrycke*. *Bact. pullorum* and *Bact. gallinarium* were agglutinated by this serum in high dilution. This information was considered of sufficient interest to justify a study of the antigenic properties of the three organisms. A strain of *B. paratyphosus* B was included for the purpose of comparison.

The agglutination tests were conducted with antigens prepared by growing the organism on agar flats, and washing off the growth with physiological salt solution, to which .5 per cent of phenol had been added. The suspended bacteria were filtered through cotton and standardized to a turbidity of 3, according to McFarland's nephelometer. The agglutination-absorption tests were made with bacteria washed in physiological salt solution and sedimented by centrifugation. Small doses of the sedimented bacteria were added to the serum to be absorbed until the agglutinins for the absorbing strain were entirely removed in a 1-to-25 dilution.

Mature chickens were used for the production of antisera, following a preliminary test for bacillary white diarrhea and

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fowl typhoid. At least one antiserum was produced for each culture listed in table I by intraperitoneal injection of heat-killed bacteria, followed by intravenous injection of the phenol-killed bacteria.

The source of each culture used in these studies is given in table I. The reactions of the various cultures on dextrose,

TABLE I—Sources of cultures used

CULTURE	IDENTIFICATION	SOURCE
<i>Bact. pullorum</i>	P 21	Isolated from baby chick
<i>Bact. gallinarium</i>	P 6	Isolated from baby chick
<i>B. aertrycke</i>	3	No. 922—T. Smith
<i>B. aertrycke</i>	4	No. 146—C. Krumweide, Jr.
<i>B. aertrycke</i>	5	Isolated from stock guinea pig
<i>B. aertrycke</i>	5a	Isolated from stock guinea pig
<i>B. aertrycke</i>	6	Ent. 135 Jordan
<i>B. aertrycke</i>	7	Ent. 137 Jordan
<i>B. aertrycke</i>	8	K. Howell
<i>B. paratyphosus</i> B	1	T. 2 Jordan

maltose, xylose, mannose, rhamnose, lactose, sucrose, inulin, inosite, and salicin were typical for all strains except culture 8, which resembles *B. paratyphosus* B in its ability to ferment inosite.

The interesting features resulting from direct agglutination are presented by four graphs listed in fig. 1. A study of these graphs shows a striking similarity in the antigenic properties of *Bact. pullorum*, *Bact. gallinarium*, and strains 3, 5, 5a, 6, and 7 of *B. aertrycke*. All of the antigens prepared from these cultures were agglutinated by their respective antisera, the only difference being in the relative agglutinability (A,B,C, fig. 1). The pullorum antigens were the most sensitive and agglutinated in a higher dilution than either the gallinarium or aertrycke antigens. Agglutinins for *B. paratyphosus* B were readily demonstrated in all *B. aertrycke*, but not *Bact. pullorum* and *Bact. gallinarium* antisera. As a rule, the titer for *B. paratyphosus* B was the same as it was for its homologous antigen (graph C).

Further evidence of similarity in antigenic properties of the five guinea pig and two chicken paratyphoids was obtained with the agglutinin-absorption tests. The agglutinins for *Bact. pullorum*, *Bact. gallinarium*, and the five strains of *B. aertrycke* were entirely removed from their respective antisera by absorption with any of the seven cultures (table II). The group agglutinins in the antisera for the five aertrycke strains were readily ab-

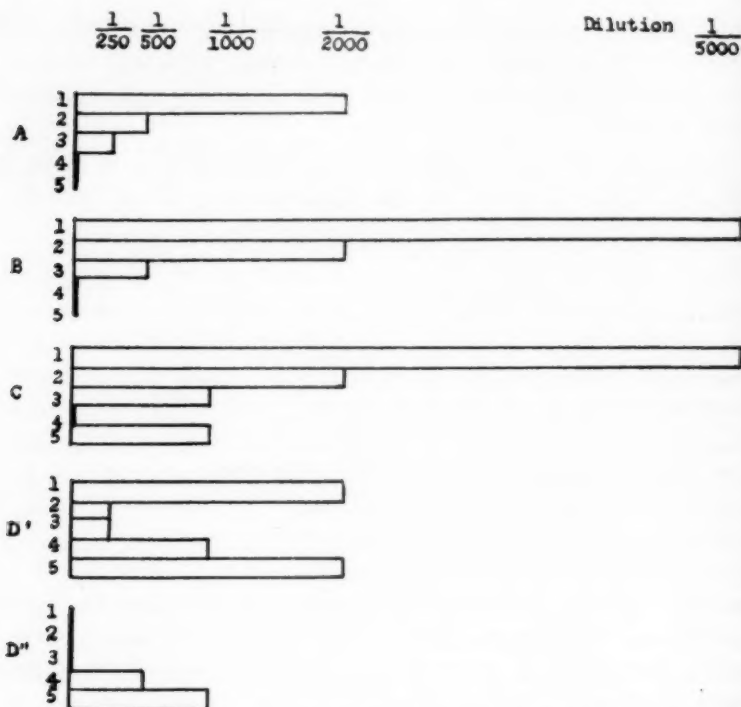


FIG. 1. Agglutinin titer of antisera for (A) *Bact. pullorum*, (B) *Bact. gallinarium*, (C) *B. aertrycke* 3, (D) *B. aertrycke* 4 unabsorbed, (D') *B. Aertrycke* 4 absorbed with *Bact. gallinarium*; 1, *Bact. pullorum*; 2, *Bact. gallinarium*; 3, *B. aertrycke* 3, 5, 5a, 6 and 7; 4, *B. aertrycke* 4 and 8 5, *B. paratyphosus* B.

sorbed by either *B. paratyphosus* B or the two *B. aertrycke* strains 4 and 8, with but slight reduction on the titer of the sera for *Bact. pullorum*, *Bact. gallinarium*, and their homologous antigens. Two types of agglutinins in the pullorum or gallinarium antisera could not be demonstrated in like manner.

The ability of the two *B. aertrycke* strains (4 and 8) to absorb

TABLE II—Agglutinin absorption

ANTISERUM	ABSORBING STRAIN			
	PULLORUM P 21	GALLINARIUM P 6	AERTRYCKE 5	AERTRYCKE 4
Pullorum P 21	Complete Absorption	Complete Absorption	Complete Absorption	Not absorbed
Gallinarium P 6	Complete Absorption	Complete Absorption	Complete Absorption	Not absorbed
Aertrycke 5	Complete Absorption	Complete Absorption	Complete Absorption	Absorbed for <i>B.</i> <i>paratyphosus</i> B

but one type of agglutinin in the antisera for strains 3, 5, 5a, 6, and 7, suggested a difference in their antigenic properties. This difference is more definitely shown in graph D, which illustrates the results with a *B. aertrycke* 4 antisera before and after absorption. The unabsorbed serum agglutinated all the organisms included in the present studies. Absorption with *Bact. gallinarium* P 6 removed the agglutinins for *Bact. pullorum*, *Bact. gallinarium* and the five strains of *B. aertrycke*. The titer of the absorbed serum for *B. paratyphosus* B and its homologous antigen was reduced about 50 per cent. These results were duplicated when either *Bact. pullorum* or *B. aertrycke* was used as the absorbing strain. An antiserum for *B. paratyphosus* B was tested and found to have a higher titer for all antigens, but otherwise it reacted much the same as the one illustrated in graph D.

Since the antigenic properties of *Bact. pullorum*, *Bact. gallinarium* and the five strains of *B. aertrycke* were found to be quite similar, it was decided to test the immunity of hens injected with the aertrycke strains against *Bact. gallinarium*. A total of 24 hens, four of which had been injected with strains 4 and 8, twelve with strains 3, 5, 5a, 6, and 7, and eight controls were fed virulent cultures of *Bact. gallinarium*. The four birds, that had been injected with strains 4 and 8, and the eight controls died or were killed on account of showing marked symptoms of fowl typhoid at the end of three weeks. Autopsies in every case showed marked lesions of the disease. Of the twelve birds injected with cultures 3, 5, 5a, 6, and 7, four died from fowl typhoid, but the remainder were healthy when autopsied at the end of three weeks, and showed no evidence of the infection.

SUMMARY

Antisera for *Bact. pullorum* and *Bact. gallinarium* agglutinated five out of seven strains of *B. aertrycke*. The agglutinins produced by the five aertrycke strains were separated into two parts by absorption with *B. paratyphosus* B. The unabsorbed agglutinin appeared identical with that produced by *Bact. pullorum* and *Bact. gallinarium*. Eight out of twelve hens injected with five strains of *B. aertrycke* were immune to *Bact. gallinarium*.

Two strains of *B. aertrycke* exhibited antigenic properties resembling those of *B. paratyphosus* B. Four hens injected with these two strains of *B. aertrycke* were not immune to *Bact. gallinarium*.

A PRELIMINARY NOTE REGARDING THE PRESENCE OF DAVAINEA PROGLOTTINA IN WASHINGTON

By J. W. KALKUS

*Superintendent Western Washington Experiment Station of the
State College of Washington*

In routine examination of poultry by autopsy at this station, over a period of years, we have frequently encountered the presence of so-called microscopic tapeworms in the intestines. Dr. W. T. Johnson called the writer's attention to this parasite in an occasional bird in 1923, and stated that he had observed it for a number of years prior to that time. No particular attempt was made to identify the worm or to determine its source, as it was not being encountered with any great degree of regular-

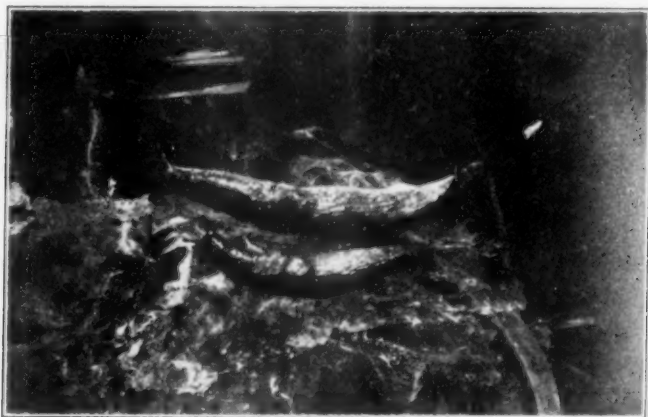


FIG. 1. A common species of garden slug which acts as intermediate host for the microscopic poultry tapeworm. (About natural size.)

ity nor was it considered to be causing any serious infestation. During the past two years, however, Drs. C. E. Sawyer and C. M. Hamilton, of our Veterinary Department, have been encountering this parasite with increasing frequency and are now of the opinion that it may become a serious economic pest in this section of the country.

During the past season a lot of one thousand pullets raised on free range on the Experiment Station grounds showed considerable infestation after being placed in the laying-house. Many of these birds became emaciated, were unthrifty and

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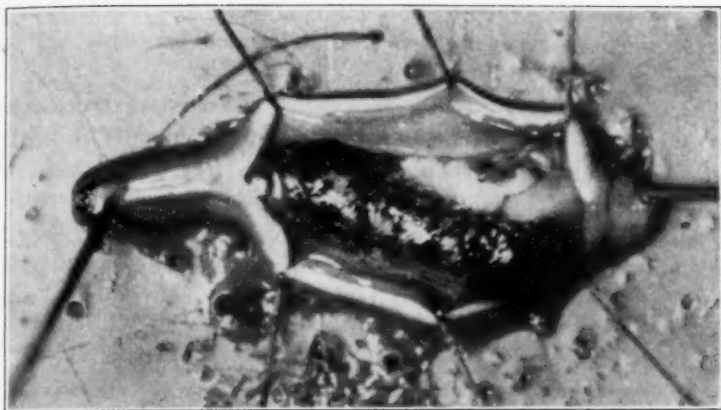


FIG. 2. A slug showing the abdomen exposed by an incision through the ventral median line. The small white spots are numerous cysticercoids, which are pearl-like bodies indistinguishable to the naked eye but readily seen with a low-power hand-lens. (Enlarged approximately four diameters.)

showed other indications of illness. Cestodes were found in varying numbers in birds autopsied. A study of the external characteristics indicates that in all probability these cestodes belong to the species known as *Davainea proglottina*. In making a search for the intermediate host of this cestode we have been



FIG. 3. Microphotograph of several cysticercoids removed from specimen shown in fig. 2. Note the invaginated area, the rostellar circling and the four sucker-discs plainly visible in some of these. These were imbedded in the slug's omentum and each represents a larval tapeworm. (Magnified about 150 diameters.)

able to demonstrate large numbers of cysticercoids in quite a large percentage of common garden slugs (probably *Limax civeus*) collected in chicken-yards.

The life cycle of *Davainea proglottina* was first demonstrated experimentally by Grossi and Rovelli,² and their work indicates that infected slugs fed to chickens will cause the development of mature worms in the course of eight days.

In the United States the occurrence of the worm has been recorded by Ransom,³ from Pennsylvania and Maryland. More recently it has been reported by Chandler,⁴ who also demonstrated its life cycle experimentally.

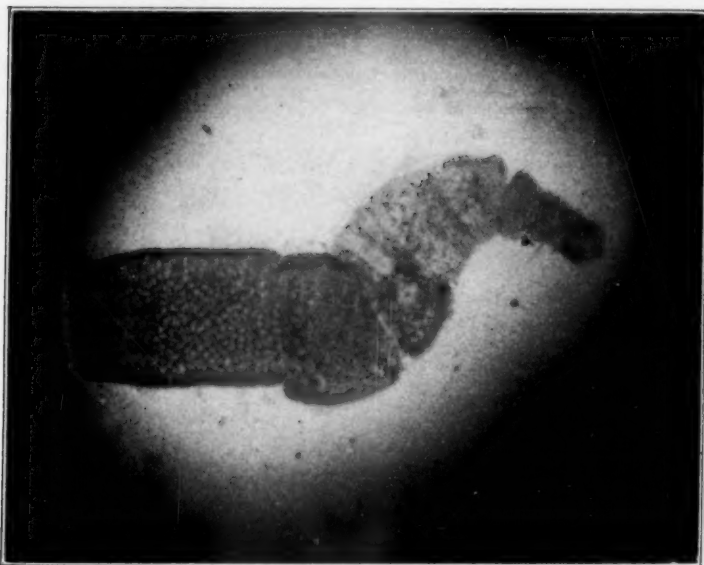


FIG. 4. Microphotograph of an adult tapeworm about 2 mm. in length. This is one of many taken from the intestines of a bird fed an infected slug twenty-two days earlier. Note the head with rostellum and two sucker-discs showing. The terminal segment is mature, filled with eggs and ready to be detached. (Magnified about 50 diameters.)

During the past few weeks experimental work has been done at this Station by members of our Veterinary Department and by Mr. William W. Baker, our entomologist. For this work 6½-months-old cage-raised White Leghorn birds have been used. They have been fed varying amounts and numbers of naturally infected slugs and autopsied at varying times.

January 26, 1928: Four birds (1, 2, 3, and 4) were each fed one-quarter of a composite sample of three slugs showing cysticercoids (the slugs were cut in pieces). On the same date two birds (5 and 6) were fed one slug each containing no cysticercoids. Eight days later, bird 1 was autopsied

but no cysticeroids or tapeworms could be demonstrated in the intestines or intestinal contents. Fifteen days after feeding slugs, bird 2 was autopsied and numerous tapeworms were demonstrated in the intestines. Twenty-two days after feeding slugs, bird 3 was autopsied and numerous tapeworms demonstrated (anterior six inches of intestines, 62 worms). Eggs were demonstrated in terminal segments. Some worms showed six and seven segments. Twenty-five days after feeding slugs, bird 4 showed numerous tapeworms on autopsy.

Birds 5 and 6 were autopsied twenty-six days after feeding slugs but no tapeworms or cysticeroids were demonstrated. On February 2, 1928, bird 7 was fed one slug heavily infected with cysticeroids. This bird was autopsied twenty days later and 243 tapeworms were counted in the intestinal tract.

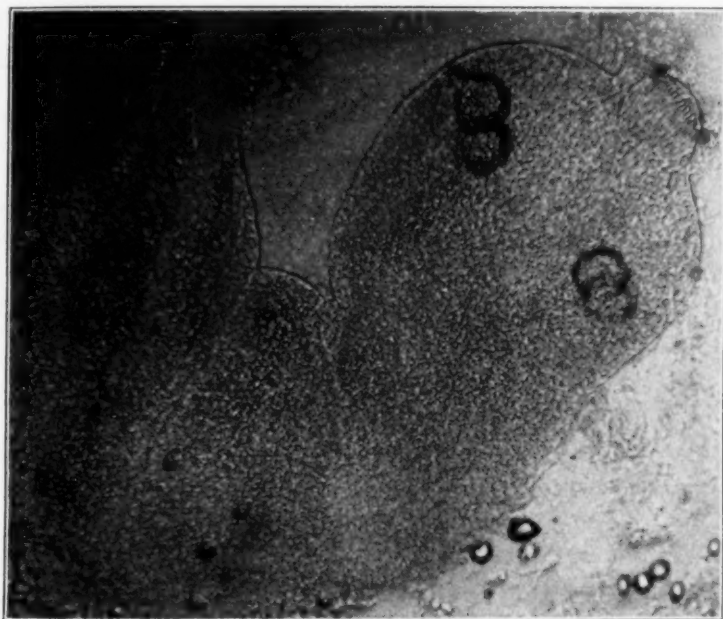


FIG. 5. Microphotograph of the head of the tapeworm shown in fig. 4. Note the projecting rostellum with hooklets and the four sucker-discs. Two of the latter are indistinct, as they are on the opposite side of the head, showing through the transparent tissue, and therefore slightly out of focus. (Magnified about 260-diameters.)

Slugs are a very common and widespread pest in western Washington, because of our mild, damp climate, and since it is now an established fact that the tapeworm harbored by them in its intermediate stage is found in many widely scattered districts, it is to be expected that control of the parasite will become an increasingly greater problem.

Experiments are now under way at this station for the further study of the life cycle of the parasite, its distribution, the effect on the host and suitable method of control. Since there are a

number of species of slugs in western Washington, a study of these is also under way.

It has been shown by Chandler that apparently some species are particularly susceptible to infection, while others are apparently quite resistant. Hence an attempt will be made to determine the various species, make a survey of their distribution, infect them artificially, determine the length of time necessary for development of infective cysticercoids and the length of time they remain infective.

REFERENCES

- ¹Grassi, B. B., & Rovelli, G.: Embryologische forschungen an cestoden. Centrabl. f. Bakt. u. Parasit., v (1889), pp. 370-377 and 401-410.
²Grassi, B. B., & Rovelli, G.: Ricerche embriologiche sui cestodi. Atti Accad. Gioenia di Sci. Nat. in Catania, iv (1892), pp. 1-108.
³Ransom, B. H.: The taenioid cestodes of North American birds. Bul. U. S. Nat. Mus., ix (1909), p. 68.
⁴Chandler, A. C.: Observations on the life cycle of *Davainea proglottina* in the United States. Trans. of Amer. Micro. Soc., xlii (1923), 3.

CONVENTION NOTES

Georgia sent one member to the meeting, Dr. C. L. Wagner, of Albany.

Dr. J. V. Knapp, State Veterinarian of Florida, was the only member present from the Everglade State.

Virginia had three members registered: Drs. H. C. Givens, of Richmond; R. A. Runnells and I. D. Wilson, of Blacksburg.

Alabama had two members in attendance; Drs. C. A. Cary and I. S. McAdory, both of the Alabama Polytechnic Institute, at Auburn.

Arkansas was another state with a pair of members in attendance: Drs. J. H. Bux, of Little Rock, and C. H. Noffsinger, of DeQueen.

Dr. M. Jacob, Knoxville; Dr. W. B. Lincoln, Nashville; Dr. W. M. Bell, Nashville, and Dr. John H. Gilman, Memphis, were the representatives from Tennessee.

A quintet of members were present from the Lone Star State: Drs. Ben F. Green, Cumby; J. S. Grove, Fort Worth; R. P. Marsteller, College Station; J. T. Trayler, Harlingen, and N. F. Williams, Fort Worth.

Considering the distance to Minneapolis, Mississippi was quite well represented at the meeting, with five members: Drs. C. B. Cain, A. & M. College; R. H. Mohlenhoff, Cleveland; O. M. Norton, Greenville; R. V. Rafnel, Jackson, and R. H. Stewart, Indianola.

KENNEL GRANULOMA

By WILLIAM H. FELDMAN, *Rochester, Minnesota*

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That health is a relative condition is well exemplified in the case of certain formidable-appearing, tumor-like growths which sometimes arise in the skin of presumably healthy dogs which have been confined for a long time in certain types of kennel cages. Grossly these formations resemble true neoplasms and a histologic examination is usually necessary in order to establish their true nature.

In a large population of dogs confined, except for frequent short periods of exercise, in cages with wire-grate floors, a dog is occasionally observed with such tumor-like formations. They usually appear over the posterior portion of the sternum (fig. 1) or over the tuber ischii (fig. 2). These regions are in contact with the grating of the floor of the cage when the animal is in a recumbent position or sits on his haunches, and hence are subject to slight though constant trauma.

In some dogs these growths develop with considerable rapidity, while in others they progress slowly. The growths seem to depend more on the susceptibility of the animal's tissue to irritative stimuli than on the length of time he has remained in a cage. They do not appear to embarrass the general health of the affected animal although from their size and position they may be somewhat annoying and disfiguring. Large growths are often offensive in appearance and for this reason surgical removal may be attempted.

Removal is not attended by any technical difficulty. The operation can be accomplished under local anesthesia, a 1 per cent solution of novocaine being satisfactory. Although the growths are easily removed, rapid recurrence takes place in many instances. Recurrence may occur indefinitely, but metastasis never occurs, and in this respect these expressions of hyperplastic scar tissue differ from certain of the true tumors with which they may be confused. Evidence is lacking that such tissue ever loses its granulomatous character and becomes a true neoplasm. The histologic appearance remains constant.

SUSCEPTIBILITY

The percentage of confined dogs which develop these tumor-like masses is very low, probably not more than 0.5 per cent. This low percentage suggests that the tissues of most dogs possess an inherent inhibitory factor which keeps the regenerative stimuli within certain physiologic bounds. The injured tissues



FIG. 1. Kennel granuloma. Sessile type of growth. The dog had been confined in a cage for sixteen months.

of those which do not possess this biologic inhibition engage in a continuous proliferation far in excess of the requirements of restoration. Once released from the restraining influence necessary for proper growth and maintenance, the tissues continue to proliferate until a definite tumor results. Here there is suggestive evidence that neither trauma nor irritation alone is sufficient to cause overproduction of tissue. The second factor might be

referred to as predisposition, lack of resistance, or an inherent biologic weakness on the part of the injured cells.

GROSS CHARACTERISTICS

Grossly these growths are of two types. In one type the mass is circular, raised abruptly above the surrounding skin, and has a sessile type of attachment (fig. 1); in the other it is pedunculated and somewhat irregularly lobulated (fig. 3). The size is variable and depends on several factors, such as duration of the disease, type of growth, and capacity of the particular animal's



FIG. 2. Kennel granuloma. Same animal as that shown in fig. 1, after confinement in a cage for twenty-four months. Growths over the tuber ischii are shown.

tissues to proliferate; the last is of maximal importance in determining the ultimate size which the growth may attain. The growths are devoid of hair and are of a flesh-pink color. They are tough, but their position on the animal's body renders them exposed to continual trauma and their extreme vascularity often causes hemorrhage. The surface is sometimes moist and infected. The infection, however, is usually mild and suppuration is rare. Manipulation does not seem to cause discomfort.

PATHOLOGIC HISTOLOGY

Microscopically the growths are of simple design; the constituents are few and their arrangement is similar to that of a fibroblastoma. The predominating cell is an immature fibroblast which is characterized by overproduction of dense collagen material disposed in a very irregular manner (fig. 4). Mitosis is sometimes observed. The tissue is richly supplied with blood-channels, which are usually little more than capillaries, although small irregular arterial channels are occasionally seen (fig. 5).



FIG. 3. Kennel granuloma. Pedunculated type of attachment, irregularly lobulated, ten months after operation. The original mass had been removed after confinement in a cage for nineteen months.

The presence of infection is often demonstrated by the large numbers of polymorphonuclear leukocytes scattered throughout the tissue. Lymphocytic infiltration may also be observed. In areas that have been denuded of surface covering, leukocytic infiltration is particularly intense. The leukocytes usually show the effects of a retrogressive influence, and pyknotic changes of the nuclei are common. The tissue is invested with a layer of epidermis which is a continuation of the normal skin.

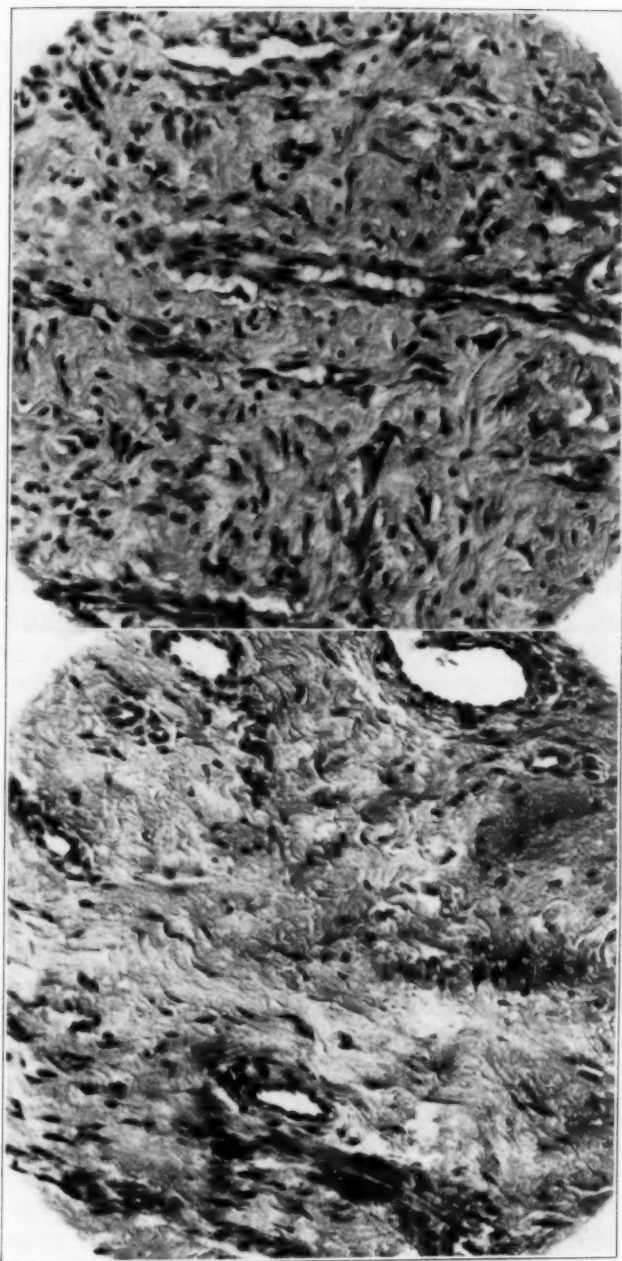


FIG. 4 (above). Keloid type of structure in growth shown in fig. 1. The presence of small blood-channels in the midst of dense fibrous tissue is typical of these structures. (x 220)

FIG. 5 (below). Growth from animal shown in fig. 3. Dense hyalinized collagen substance. Well-formed blood-channels are abundant. (x 220)

COMMENT

From the histologic picture it is evident that these growths are similar in most respects to granulation tissue and might be properly called keloids. They are not true neoplasms, since they arise as a direct result of a definite injury, the repair of which puts into operation a normal phenomenon characterized by the proliferative activity of the resident fibroblasts and associated vascular elements. The reaction differs from normal repair only in the fact that proliferation does not cease with restoration to normal. The fact that these granulomatous masses recur after removal but fail to metastasize rather definitely distinguishes them from the true neoplasms.

SUMMARY

In a small percentage of dogs, after continued and prolonged residence in cages with the grate type of floor, fleshy growths of a keloid nature develop in the skin. This small percentage suggests the existence of predisposition in the affected animals. The growths usually recur after removal. The fact that the histologic picture is that of a granulomatous proliferation with failure of the cells, even though of a vigorously growing recurrent type, to produce metastasis would remove this formation from the category of true tumors.

CONVENTION NOTES

Canada was well represented with sixteen members from six provinces: Drs. J. C. Hargrave, Medicine Hat, Alberta; W. H. McKenzie, Vancouver, B. C.; J. A. Allen, W. Hilton, J. B. Still, and M. J. Kellan, Winnipeg; Harry H. Ross, Brandon, Manitoba; Orlan Hall, George Hilton, and Bruce Kennedy, Ottawa; C. D. McGilvray, Guelph, W. A. Henderson, Stratford, Ontario; J. A. Leish, Montreal; E. A. Watson, Hull, Quebec; M. Barker, Regina; S. Hadwen, Saskatoon, Saskatchewan.

Michigan sent nineteen veterinarians to the meeting: Drs. F. E. Caswell, North Adams; O. G. Davidson, Kalamazoo; H. Elzinga, Marne; M. J. Geiger, Crosswell; Ward Giltner and H. J. Stafseth, East Lansing; E. K. Hansen, Marquette; L. J. Heiden, Escanaba; B. J. Killham, Lansing; F. M. McConnell, Litchfield; B. A. Perry, Hastings; R. D. Rice, Maple Rapids; F. E. Stiles, Battle Creek; G. M. Thorndike, Alto; J. Y. Veenstra, Grand Rapids; E. J. Watters, Houghton; H. Preston Hoskins, E. E. Patterson, and A. S. Schlingman, Detroit.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

AN INFECTIOUS DISEASE OF SWINE DUE TO AN ENTEROCOCCUS?*

By A. VANDERHEYDEN and L. DESAINT MOULIN

Translated by T. P. WHITE, Washington, D. C.

The enterococcus is a normal saprophyte of the digestive tube of man and animal. It is found in the healthy subject in the mouth, the nose, the pharynx and throughout the alimentary canal. It has been found on the skin and on the genital organs of man and woman. This microbe was defined by Thiercelin and for a long time had been known to Eguet, Besson and others under the name of streptococcus (encapsulated). Various names have been given to the organism, such as streptococcus of the mouth (Marot), *Streptococcus lacticus*, *Micrococcus ovalis*, diplococcus of Claude and Block, and *Streptococcus faecalis*.

Various investigators have noted streptococcic infection in swine. While the pathogenicity of the microbe may be limited in diseases peculiar to the swine species, certain observations made are deemed worthy of attention if only for the purpose of confirmation by other investigators or a further study of the organism, as it may be involved in morbid conditions found in swine herds.

For purpose of discussion, there is cited a case in which a pig about two months old figures. At autopsy the following data were acquired: skin very slightly marked, inflamed mucous membrane of eyes, general pleuritic adhesion, right anterior lobe of lung hepatized, partial degeneration of liver, slight inflammation of intestines, no ulcers, mesentery and lymphatic glands congested, discolored spleen, stomach and urinary bladder normal. The condition of the marrow in the long bones was not ascertained.

In the laboratory, cultures on bouillon and agar of material from the liver, spleen, lungs and lymph-glands and of the heart-blood gave growths of diplos, chains, and masses of tetrads. The cultures did not reveal the presence of *B. suis* or *B. suis*.

*Médecine Vétérinaire, xi (1927), p. 469.

suipestifer nor the organism of swine erysipelas. Knowing that several pigs in the herd from which the subject had originated had died, the diagnosis of hog cholera was made.

However, having studied the germ isolated, its divers characteristics led to its being classed among the enterococci. With attention focused on this organism, a systematic examination was made of all pigs subsequently received and in three outbreaks of pig diseases, from which the germs of the ordinary swine diseases could not be isolated and in which there were no indications of hog cholera, the enterococcus was found. The symptoms in these outbreaks of disease were principally diarrhea and respiratory phenomena. Death was rapid. The principal lesions were those of severe enteritis.

CHARACTERISTICS OF ENTEROCOCCUS OF SWINE

The enterococcus of swine, like that of man, is polymorphous. Its superficial aspect is that of a diplostreptococcus. It often assumes the shape of a simple diplococcus, rounded or oval. It varies in size and is sometimes lanceolate. Perhaps its most constant characteristic is that of two or more bodies uniting at an angle. It is grown at ordinary temperature, preferably 37° to 38° C. It grows readily on ordinary media. In about 24 hours a white field appears and in 48 hours the growth is formed in a glairy deposit which adheres slightly to the sides and bottom of the tube. A characteristic considered important is the grayish-green color that the organism in its growth lends to the medium.

VACCINATION

In the human, favorable results are reported from vaccination. In swine, autovaccine has been used in a limited number of cases where the diagnosis of enterococcus disease has been made. A 24-hour culture of the organism on an ordinary medium was subjected to 65°C. for ten minutes. Each sick pig was injected with one cc of this dead culture, the injection being repeated in three days. This stopped further losses in the affected herd.

ENTROPION IN LAMBS*

By L. V. SKIDMORE

University of Nebraska, Lincoln, Nebraska

Definition: By entropion is meant the inversion or turning inward of the eyelid, so that the lashes rub against the globe

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of the eye. According to Cadiot and Breton¹ the eyelid may be inverted in part or in whole. One eyelid may be affected, sometimes both are involved, or the eyelids of both eyes may be affected.

During the past few years the author has observed this condition and operated on more than thirty lambs belonging to the University flock, which consists of 125 sheep of the following breeds: Oxfords, Hampshires, Southdowns, Rambouillet, and Shropshires. Entropion requiring surgical treatment was observed only in Shropshire lambs. Last year this condition was found in 12 out of 25 lambs. Slight cases have also been observed in Rambouillet lambs, but these always recovered without surgical interference.

Animals affected: Entropion has frequently been observed and described in dogs and horses. Jakob² describes the condition as being most common in the large dogs: St. Bernards, Danes, Pointers and Setters. Hounds are often affected. Reed³ mentions that in little lambs the eyelid is sometimes turned under.

Cause of entropion: The cause is not definitely known. However, the author believes, from his observations, that this condition is an inherited congenital structural anomaly, because it is found in new-born lambs shortly after birth. W. Williams⁴ says that "very often entropium is congenital." According to Aubry, Bordeau and Harmon, this condition has been met with congenitally in foals.* Hadley and Warwick⁵ state: "Nowadays most structural defects of new-born animals are regarded as heritable." Haltenhof⁶ believes entropion to be inherited and it is caused, in his opinion, by overdevelopment in the skin of the lid. Brumley⁷ states that "certain breeds of dogs are predisposed thereto from their breeding." According to Merillat,⁸ "Although attributed to cicatrization of pre-existing traumas or inflammations, the cause is by no means plain." He states further: "In horses, however, both entropion and ectropion can always be traced to the cicatrization of a definite injury to the eyelids, an incomplete laceration, a through-and-through laceration, a contusion, or a surgical wound necessitated in the ablation of a tumor." While this latter statement is perhaps true in the case of the horse, it does not apply to many of the cases found in dogs and lambs. This condition is seen also in entropion musculare, which is due to the contraction of the ciliary part of the orbicular muscle resulting from senile atony.

*Reference not seen.

A relaxation of the integument of the eyelids may also be responsible for this condition. The two latter-mentioned conditions are associated with aged animals, while the entropion described in this article is an affection of new-born lambs.

Symptoms: The eyelid or lids are inverted against the globe of the eye and the irritation from the eyelashes causes closure of the lids. Most authors agree that the lower lid is more often involved. In lambs there is a copious discharge of tears; some pus may form. The animals are uncomfortable and restless. They rarely rub the eye. The conjunctiva is reddened and congested with accompanying inflammation, with various degrees of keratitis present. Sometimes there is ulcer formation of the cornea and in extreme cases there may be adhesions of the lid to the cornea which usually results in permanent damage and blindness.

Diagnosis: The condition is easily recognized. The eyelid, usually the lower, or an upper, or perhaps both, are inverted, turned inward against the globe of the eye. If the finger is applied to the outside of the eyelid and the skin pressed down or up (depending upon whether the lower or upper lid is tested), the margin of the lid will go in proper position. When the finger is released and the eyeball is moved, the lid again becomes inverted.

Treatment: Simple cases may be treated by the daily application of boric acid salve. Such cases may be treated also by holding the lid in proper position by means of strips of adhesive tape. In many cases, surgical treatment is the best procedure and should be employed as soon as entropion is observed in order to protect the cornea from serious and permanent damage from inflammatory processes.

Technic of operation: The animals are restrained by laying them on one side with the affected eye uppermost. The head is held firmly. The use of a local anesthetic may be employed. The hair and wool are clipped for a distance of about three-fourths of an inch from the edge of lid. The area is washed with a 2 per cent boric acid solution. A fold of skin one-fourth inch from the edge of the lid and parallel to it is picked up with a pair of forceps, midway between the outer and inner canthus of the eye. Care is taken not to draw the conjunctiva into the picked-up skin fold.³ Now, with a pair of scissors, an elliptical piece is excised, according to the degree of the inverted lid. The operator must determine just how much to remove,

for if too much is removed, eversion of the lid will follow and if too little, inversion will remain. It is always better to remove too little than too much.¹⁰ Some operators state that they do not suture the surgical wound in such animals as the horse and dog. Others give a preference for suturing. In lambs, the author prefers to suture the wound with two to four interrupted sutures using No. 7 braided silk suture.

Prognosis and after-treatment: If the operation has been properly performed before serious damage is done to the eye, the prognosis is always favorable. There is no danger from hemorrhage. The wound heals very readily and the stitches can be removed in 5 to 7 days. No further treatment is necessary.

The following references treat with entropion in the horse and dog. No mention is made of this condition in lambs in any of the references with the exception of Reed.³

REFERENCES

- ¹Cadiot, P. J., & Breton, F.: *Médecine et Chirurgie Canines* (4th ed.; Vigot Frères, Paris, 1924), pp. 280, 346.
²Jakob, H.: *Krankheiten des Hundes* (Verlag Von Ferdinand Enke, Stuttgart, 1913), pp. 158-160.
³Reed, H. E.: Sheep production in Kansas. *Kans. State Agr. Exp. Sta. Bul.* 240 (1927), pp. 37-38.
⁴Williams, W.: *The Principles and Practice of Veterinary Surgery* (Rev. ed.; W. R. Jenkins, New York, 1891), pp. 550-551.
⁵Hadley, F. B., & Warwick, B. L.: Inherited defects of live stock. *Jour. A. V. M. A.*, lxx (1927), n. s. 23 (4), pp. 492-504.
⁶Möller, H.: *Lehrbuch der Augenheilkunde für Tierärzte* (4th ed.; Verlag Von Ferdinand Enke, Stuttgart, 1910), pp. 378-381.
⁷Brumley, O. V.: *Diseases of the Small Domestic Animals* (Lea & Febiger, Philadelphia & New York, 1921), pp. 499-500.
⁸Merillat, L. A.: *Veterinary Surgical Operations* (Alexander Eger, Chicago, 1910), III, p. 453.
⁹Williams, W. L.: *Surgical and Obstetrical Operations* (2nd ed. rev.; W. L. Williams, Ithaca, N. Y., 1907), p. 50.
¹⁰Scott, W.: *An Indexed System of Veterinary Treatment* (Alexander Eger, Chicago, 1922), pp. 169-170.

REPORT OF AN OUTBREAK OF POISONING IN THE DOMESTICATED FOWL, DUE TO DEATH CAMAS*

By K. W. NIEMANN, *Manhattan, Kansas*

INTRODUCTION

Death camas (*Zygadenus* sp.) poisoning is known to occur naturally in sheep and cattle and sometimes in horses and men. However, as far as can be learned, no cases of such poisoning occurring naturally among domesticated birds have been reported, which would indicate that the plant as a source of poisoning in fowls has probably been overlooked.

Death camas poisoning is more frequent in sheep and cattle than in other animals. This may be accounted for by the fact

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that they are limited more to range conditions than other types of live stock and consequently are more subject to partial inanition with respect to green feed. This partial starvation often results in the ingestion of green plants that would otherwise be left alone due to their unpalatability. The fact that the disease has not been reported in domesticated birds is no doubt due to the usual abundance of more palatable contemporary sources of succulent feed.

The usual history of death camas poisoning includes a spring frost preceding the poisoning of mammals and it is reasonable to assume that this would apply to domesticated birds as well.

In March, 1927, a peculiar outbreak of poisoning among poultry was called to the attention of this Department and an investigation indicated death camas to be the cause.

DESCRIPTION OF THE PLANT

According to Marsh, Clawson and Marsh,¹ death camas belongs to the genus *Zygadenus* and the members of this genus generally conceded to be poisonous are *Z. glaberrimus*, *Z. intermedius*, *Z. mexicanus*, *Z. nuttallii*, *Z. paniculatus* and *Z. venenosus*. The offending plant in this case was identified as *Z. nuttallii*. The plant is ably described by Fleming and Peterson.²

The group of closely-related plants known as death camas were formerly included in the lily family; but this family has recently been broken up by botanists who placed the death camas in the "bunch-flower" family (Melanthaceae).

Death camas is commonly confused with the wild onion although it has no onion odor. When in bloom the two are easily distinguished, for all the flowers of the onion cluster grow out from the tip of the flower stem, while the flowers of the death camas grow along the sides of the stem.

The time when death camas starts to grow in the spring varies with the season and also with different exposures and different soils; the green shoots are sometimes found in the middle of March. The plants make their appearance first on sandy soils and on southern exposures which are usually favorable for the location of poultry-yards. On dark loamy and clay soils growth is much retarded; probably because these soils are moist and consequently warm up less readily. If the weather is fairly warm the death camas will begin to grow from ten days to two weeks after the snow melts in the spring; and the leaves are soon

high enough to be eaten. By the latter part of June the aerial portion of the plant has usually died.

Death camas is the name by which these plants are commonly known on the range; but they are also called mystery grass, poison sago, poison onion, lobelia, and poison camas.

The toxic principle of the plant is an alkaloid which resembles veratrin or cevadin. Since the toxic principle is alkaloidal in nature, no macroscopic postmortem changes are visible. However, symptoms of inanition, in cases where prolonged coma has preceded death, may be observed.

DISCUSSION OF THE OUTBREAK IN FOWL

The case in question occurred in March, 1927, the plants were numerous on the poultry range and it is probable that other sources of green feed were either unavailable or less prominent. No birds were received for examination but according to the owner the birds showed cerebral symptoms as evidenced by incoordination, dizziness, staggering gait, prostration and coma. The birds survived only from 24 to 48 hours after the first symptoms were noticed. Following a suggestion that the flock be confined, losses ceased. According to available history some losses had occurred on this same range in preceding years.

EXPERIMENTAL OBSERVATIONS

A sample of the offending plant was sent to the laboratory for examination. A small amount (five to ten grams) of this material was ground in a mortar and fed to a Single Comb White Leghorn cockerel. In 12 hours marked symptoms of poisoning were evidenced by salivation, incoordination, muscular weakness, staggering gait followed by prostration. Diarrhea was one of the early symptoms and persisted until death. The droppings were characterized by a peculiar, penetrating, highly disagreeable odor. Following this the bird became semi-conscious and remained in this condition with a very limited consumption of food and water until its death. It apparently improved on the 18th day, but died on the day following. The picture (fig.1) was taken on the 17th day.

Specific macroscopic autopsy findings were negative except for the strong, penetrating, disagreeable odor present. The bird showed pronounced muscular and glandular atrophy. The lumen and contents of the intestine were markedly diminished. The mesenteric and abdominal blood-vessels showed

marked passive congestion. The lungs were markedly anemic. The described changes with the exception of the odor may be ascribed to the partial inanition and the lack of specific post-mortem changes is due to the fact that the active toxic principle involved in this case was an alkaloid.

TREATMENT

Remedies that have been suggested ¹ are: caffein and diuretin, strychnin, eserine, charcoal, whisky and digitalis, potassium permanganate, tannic acid, sodium bicarbonate, repeated doses of tannic acid and sodium bicarbonate, and bleeding.

However, in the case of chickens it is not usually practicable to attempt to treat the birds by any one of the above methods, their value being questionable. The most practical treatment for affected birds is to remove them to a quiet place and give



FIG. 1. Bird 17 days after having been fed death camas. Note prostration.

each one a purgative such as castor oil, linseed oil or Epsom salts. Unaffected birds should be confined until other sources of succulent feed are more available or the offending plants less available.

CONCLUSIONS

1. The occurrence of death camas poisoning in domesticated birds is probably rare, but may occur.
2. Treatment consists in confining all unaffected birds until danger of grazing upon the plant no longer exists. Purgatives and isolation are recommended for affected fowls.
3. Prophylactic measures consist in recognizing the plant and keeping the birds away from it.

REFERENCES

- ¹Marsh, C. D., Clawson, A. B., & Marsh, H.: *Zygadenus* or death camas. U. S. Dept. Agr. Bul. 125 (1915).
²Fleming, C. E., & Peterson, N. F.: Death camas (plants poisonous to sheep and cattle). Nev. Agr. Exp. Sta. Bul. 101 (1921).

SALMONELLA PULLORUM INFECTION IN RABBITS*

By J. F. OLNEY

University of Nebraska, Lincoln, Nebraska

On March 3, 1928, four rabbits were brought to the laboratory for examination. Two of these rabbits had died during the night, and two were sick and died shortly after being received.

The following history was given by the owner. About twenty-five of the breeding rabbits had died within two days. They were mature stock and in a very good state of nutrition. Upon inquiry regarding the feed, care and management, the owner stated that three or four days previous to the first death he had fed infertile eggs which had been incubated for eighteen days. The eggs were fed raw by mixing them with a grain mash. All rabbits in the breeding pens were kept in individual hutches, and fed an equal amount of the mash mixture.

The owner reported that by March 5 forty rabbits were dead, the following two days fifty more had died, and by March 12 he had lost 125 animals, leaving one buck and three does in his breeding units. He also reported that one-half of the rabbits over six months of age and one-third of those under six months, which were old enough to eat, had succumbed to the same malady. None of the suckling rabbits were affected.

AUTOPSY

Postmortem examination was made on seven rabbits dead from the disease. Each had the appearance of a reaction to a severe general infection. The heart, lungs, liver and kidneys showed a marked congestion. The most conspicuous change, however, was seen in the spleen, which was greatly enlarged and dark in color. More or less extravasation of serum was found in the thoracic and abdominal cavities.

BACTERIOLOGICAL EXAMINATIONS

Cultures were made from each of the seven animals examined. Inoculations from the heart, liver and spleen were made on plain agar media. At the same time, normal rabbits were injected intravenously with the blood of the infected ones. Rabbits inoculated with blood of the infected animals died as shown in table 1.

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TABLE I—Results of rabbit inoculations (blood)

RABBIT	INOCULATED	DIED
1	3-3-28	3-6-28
2		3-7-28
3	3-5-28	3-8-28
4		3-8-28

The sugar reactions of cultures obtained from these rabbits were the same as obtained in cultures taken from the rabbits fed on the infertile, incubated eggs.

Four rabbits were injected intravenously with the cultures obtained from the inoculated rabbits as follows:

Two were injected with a suspension of the organisms in sterile, physiological salt solution, using 0.5 cc. of the density of McFarmand's nephelometer tube 2. These rabbits died in less than twenty-four hours and the cultures taken showed the same sugar reaction as the others had shown, namely; acid and gas in dextrose and mannitol, and negative in lactose, maltose and sucrose. The second two rabbits were injected with one loopful of the same organisms. Results are shown in table II.

TABLE II—Results of rabbit inoculations (culture)

RABBIT	INOCULATED	DIED
1	3-6-28	3-10-28
2		3-11-28

Cultures were obtained from the heart, liver and spleen of each animal and each gave the typical *Salmonella pullorum* reaction on the five sugars used. Gelatin medium was not liquefied by these cultures after incubation for seventeen days.

In order to study the individual colonies and to test the purity of the cultures obtained, plates were made on March 8, and on March 11 a single colony was selected. The colonies were small, circular, opalescent, with raised surface and smooth edge.

TABLE III—Sugar reactions of organism (24 hours)

SUGAR	ACID	GAS
Dextrose	+	+
Lactose	—	—
Maltose	—	—
Sucrose	—	—
Mannitol	+	+
Arabinose	+	+

Table III shows sugar reactions of the cultures taken from the one colony.

Media containing dextrose formed the most gas, mannitol second, and the smallest amount was produced in media containing arabinose.

AGGLUTINATION TEST

An antigen was prepared from these cultures by washing a 48-hour plain agar slant with phenolized physiological salt solution and diluting to a density of tube 1 of McFarland's nephelometer.

TABLE IV—Agglutination tests

DILUTIONS	1-50	1-100	1-250	1-500
Negative <i>Salmonella pullorum</i> serum.....	—	—	—	—
Positive <i>Salmonella pullorum</i> serum.....	+	+	Partial	—

CONCLUSIONS

The rabbits died of *Salmonella pullorum* infection following the feeding of infertile, incubated eggs obtained from a commercial hatchery.

ACKNOWLEDGMENT

Acknowledgment is made of the kindness of Dr. L. V. Skidmore, of the University of Nebraska, in carefully checking up the bacteriological and serological work reported in this paper.

ANOTHER TWO-LEGGED DOG

By REUBEN GORDON, *Palchogue, N. Y.*

I read with interest the article and report regarding two-legged dogs and wish to add Long Island as having possessed such a feature.

December 31, 1927, two young boys, about 7 and 8 years old, came to my hospital with a poodle about 5 months old that they wished destroyed. It had no front legs and was the only one of a litter of five pups so handicapped. However, the dog was able to navigate quite conveniently and could do most of the playful things dogs do despite the missing front legs. After keeping the animal for a week, so that I could study its habits, I destroyed it. I regret now not having taken a snapshot of it, but I do want to put Long Island on record as having had one of these two-legged dogs.

STEINACH OPERATION*

By T. A. SIGLER, Greencastle, Indiana

On March 9, 1925, I performed my first rejuvenation operation according to Steinach. I will not attempt to discuss at this time the theories or origin of the sex hormone as there have been many articles, both in medical and veterinary journals, describing the physiological actions advanced by Steinach and his followers.

The operation consists of a ligation, on one side, of the vas deferens, just above the epididymis, and the theory is that nature's effort to restore secretions there produces a sex hormone in the opposite or unligated testicle. In describing this operation the most important point to bear in mind is asepsis, so that no infection will follow, which would produce a fatal orchitis. The loss of a testicle would foil the operation.

The technic used by myself includes both the standing and recumbent postures. Suitable stocks such as are maintained in some of the larger breeding establishments, especially for the heavy breeds, or any suitable stanchion where the animal cannot drop down during the course of the operation, will be found satisfactory. It is much easier, however, to operate in the standing posture. The most important precaution is to guard against contamination of the wound when the animal defecates. In this respect the standing position has a distinct advantage over the recumbent position. It is hard to restrain very large animals satisfactorily and usually the owner will object to throwing a large bull.

In casting, we use Ruiff's rope-tie around the body. Over this the Merillat method, using the Ruiff rope in large animals only, to cause them to lie down easily. Use the Merillat method for restraint proper. Use the latter method only on small animals. By these means we can draw them up tight, pulling the leg well forward, which will let the scrotum hang free so that the operator can get at it conveniently. After cleansing the scrotum it should be brought back through a clean sheet and the site of operation painted with iodine. The next step is to inject a local anesthetic beneath the skin and cord.

An incision is then made on the external side of the neck of the scrotum, just above the epididymis, and down through the skin and subcutaneous tissue. Expose the cord, which is now

*Presented at the sixty-fifth annual meeting of the American Veterinary Medical Association, Minneapolis, Minn., August 7-10, 1928.

pulled out through the incision and fixed by placing a probe beneath it. Here one will encounter some fat, especially in the beef breeds, and this may give quite a little trouble in separating the vas deferens. The fat should be carefully removed in order to prepare the vas deferens for ligation. Cat-gut ligatures are applied with a common suture-needle. The vas deferens is ligated in two places, cut ~~apart~~ between the ligatures, returned to its position, the membrane sutured with cat-gut, and the skin sutured with silk. The wound is then painted with iodine and covered with collodion.

The first bull I operated on, March 9, 1925, was "Imp. Cromley Dale," Shorthorn, 12 years old, which had lost all sexual desire and was not used for two months after the operation. He covered as well as a young bull and got one calf after the operation, which seemed to pep him up all over, as the owner expressed it, and he seemed to move about with a more lively gait. This herd was dispersed a short time after this and he was sent to the yards.

The second bull operated on was "Imp. Rodney," Shorthorn, 12 years old. This animal had lost all sexual desire and was not used for about six weeks after the operation. He slipped on a concrete floor in his first attempt to cover and broke down in one hip. He never got up and was slaughtered.

The third bull, "Imp. Boarder Raider," Guernsey, 14 years old, died with pneumonia a short time after the operation.

There is no question but that the operation puts life and vigor in bulls after it is done. They seem livelier and the sexual desire is stimulated and it is claimed that the operation increases the production of spermatozoa. The operation should not be put off too long as the longer the bull is allowed to go the less satisfactory will the outcome of the operation be. I would like to see this operation tried out by my colleagues and the experiment stations.

BANG BACILLUS DISEASE IN BULLS*

By C. W. SPRINGER, Uniontown, Pa.

In February, I was called to see a registered Guernsey bull suffering with a very severe case of orchitis of the left testicle. This condition had appeared rather suddenly the day before I was called. The swelling was four or five times that of the

*Presented at the sixty-fifth annual meeting of the American Veterinary Medical Association) Minneapolis, Minn., August 7-10, 1928.

normal testicle and cord, producing rather severe lameness, with swelling of all four limbs, especially of the joints. There was a high fever (105° F.) with loss of appetite and rumination.

The patient was treated with febrifuge, laxative and stimulant medicine internally, as well as a local refrigerant application to the scrotum. After a few days, the fever subsided somewhat, as well as the acute inflammation in the scrotum and testicle, but the enlargement persisted.

A few days later, the owner had the bull slaughtered and the diseased testicle was forwarded to the State Laboratory for examination. In due course of time, a report was received from the Laboratory that a pure culture of Bang's abortion bacillus had been isolated from the testicle. This was the second case of this kind observed in bulls this spring, each having been slaughtered. Symptoms were identical in each case and, while I did not have a laboratory diagnosis in the other case, I believe the cause was the same.

It is not known how prevalent Bang bacillus infection is in these herds, as neither has ever been blood-tested. Just recently I have been advised that one of these herds has lost half a dozen calves by premature birth. The blood test will be made on this herd in the near future.

I will be pleased to hear from others who have had cases of orchitis in bulls and trust that this report will provoke a thorough discussion and bring out many points of interest.

VETERINARIAN WANTED

The Commercial Club of Onamia, Minn., is very anxious to have a veterinarian locate in that village. Onamia is on the south shore of Lake Mille Laes, one of the largest bodies of water in the state of Minnesota. The community is rapidly becoming quite a dairy center and the need for an experienced and capable veterinarian is being felt. At the present time, the nearest veterinarian is twenty-four miles away from Inamia. If interested, correspond with Mr. W. A. Benzie, President, First State Bank, Onamia, Minn.

California sent a quintet to Minneapolis, consisting of Drs. George H. Hart and Fred M. Hays, of Davis; Leslie E. Pike, of Long Beach; C. E. Wicktor, of Los Angeles, and F. W. Wood, of Berkeley.

ARMY VETERINARY SERVICE

CHANGES RELATIVE TO VETERINARY OFFICERS

Captain Ralph B. Stewart has been relieved from assignment and duty at Fort Riley, Ks., effective September 1, and will report to the Commandant, Cavalry School, for duty as a student.

■ An additional student at the Army Veterinary School for the next term, beginning Sept. 1, will be Captain George L. Caldwell, who completed the troop officers' course at the Cavalry School on June 1.

Captain John W. Miner is temporarily under treatment at Walter Reed General Hospital, before going to his new station at Ft. Leavenworth, Ks.

Captain Wm. H. Dean has been assigned to temporary duty at Jefferson Barracks, Mo., for the period July 11 to August 11.

Reserve Corps

New Acceptances

Chase, Carl Eddrie.....	2nd Lt.....	Londonderry, N. H.
Fitzgerald, T. C.....	2nd Lt.....	R. F. D. No. 4, Clyde, Ohio.
Gross, Geo. Dewey.....	2nd Lt.....	R. No. 1, Fredericktown, O
Hectorne, Ronald Lester.....	2nd Lt.....	Avon, Ill.
Kleman, Edwin P.....	2nd Lt.....	Clarksville, Tenn.
Martin, Carl L.....	2nd Lt.....	Colebrook, N. H.
Robb, Joseph R.....	2nd Lt.....	Cadiz, Ohio.
Scheetz, Geo. F.....	2nd Lt.....	South Charleston, O.
Thomas, Owen E.....	2nd Lt.....	Pataskala, O.
Thompson, A. T.....	2nd Lt.....	Ely, Minn.
Bishop, Wm. J.....	1st Lt.....	Bartlesville, Okla.
Edgar, Jean R.....	2nd Lt.....	Spokane, Wash.
Webber, O. B.....	Captain.....	Rochester, N. Y.

Promotions

Catlett, James G., to.....	Major.....	Health Dept., City Hall, Miami, Fla.
Low, Frederik, to.....	Captain.....	Oakes, North Dakota.
Farmer, Harvey T., to.....	Captain.....	3100 North Ave, Richmond, Va.

Separations

Bogan, James J.....	2nd Lt.....	Failed to accept reappointment.
Bogan, John L.....	2nd Lt.....	Failed to accept reappointment.
Bramer, C. N.....	2nd Lt.....	Failed to accept reappointment.
Brower, Wm. P.....	2nd Lt.....	Failed to accept reappointment.
Hess, Roy F.....	2nd Lt.....	Failed to accept reappointment.
Kidd, Harry L.....	2nd Lt.....	Failed to accept reappointment.
McCrillis, John J.....	2nd Lt.....	Failed to accept reappointment.
Merriman, Robt. Wm.....	2nd Lt.....	Failed to accept reappointment.
O'Malley, G. F.....	2nd Lt.....	Failed to accept reappointment.
Tremlett, James R.....	2nd Lt.....	Failed to accept reappointment.
Whipple, Earl F.....	2nd Lt.....	Failed to accept reappointment.
Moye, K. J.....	Captain.....	Failed to accept reappointment.
Pickup, Earle S.....	Captain.....	Declined reappointment.
Torgersen, H. E.....	Lt. Col.....	Declined reappointment.

Veterinarians of Scott County (Ill.) met at the Davenport Hotel, Davenport, Ill., June 12, 1928, and organized the Scott County Veterinary Association. Dr. H. F. Culp, of Eldridge, was elected president, and Dr. R. V. Beard, of Davenport, was chosen to act as secretary-treasurer.

MISCELLANEOUS

TESTIMONIAL DINNER TO DR. MALCOLM C. BAKER

May 30, 1928, marked two most happy events in the lives of the alumni of the Montreal and McGill Veterinary colleges, who gathered from far and near at Montreal to do honor, in the first place, to one of their much-beloved teachers, in the form of a testimonial reunion and dinner to Professor Malcolm C. Baker; and secondly, and on the same day, to attest by their presence at McGill University, their appreciation of the honors that day bestowed upon their colleague, Dr. Wm. Reid Blair, of New York City.*

The dinner, which was attended by over thirty of the alumni, was held at the Windsor Hotel. The number attending from the United States was approximately that representing Canada. The entire affair was in every sense highly expressive of the love and good-will which prevails throughout the entire alumni body for their old teacher of anatomy, who is now seventy-eight years young, and, like Johnny Walker of Scottish fame, is still growing strong at that and able to do his daily dozen cases with the best of us.

Dr. Baker was graduated from the old Montreal Veterinary College in 1879, and was at that time appointed to the chair of Comparative Anatomy at that institution, a position which he filled with great and ever-increasing distinction for nearly a quarter of a century.

The banquet was of choice a closed alumni affair, the only person present, not an alumnus, being Dr. Baker's son, who, following the footsteps of his sire, shares with him the burdens of one of the largest practices in the Dominion.

The gathering was ably presided over by Dr. J. B. Hollingsworth ('98), and after the toasts usually offered upon such occasions, the toast to the guest of the evening was, in words highly appropriate to the evening and the person addressed, proposed by one of Dr. Baker's classmates, Dr. Charles Winslow ('79), of Rockland, Mass., and responded to by Professor Baker, who charmed his boys anew with the apparent ease with which he still seemed able to hold his class, by the simplicity and directness of his discourse, combined with the accuracy and intimacy

*See JOURNAL, July, 1928, p. 375.

of his personal remembrances of various individuals present and some of their outstanding idiosyncrasies.

There was so much of intrinsic pleasurable interest in the whole evening, as to render the entire company, especially those from south of the line, almost oblivious to the qualities of law, as they appeal to personal freedom within the Canadian city. We have dwelt upon the love of former students for Dr. Baker, but lest we forget the more important point of his standing at home, let us quote the words of one of Montreal's most foremost citizens, spoken to the writer of these lines upon the morning of May 30, upon learning of the intentions to meet in Professor Baker's honor that evening:

I wish we men of Montreal had known of this affair, as there are thousands of Montreal's best who would like to have joined up with you in any honors you may wish to pay to "Mac" Baker tonight.

After the presentation to Professor Baker of a beautiful cane, suitably engraved, the happy and successful gathering came to a close with warm acclaim for the distinguished guest and the lusty singing of "Auld Lang Syne."

F. H. M.

HORSE-TRADING

By N. S. MAYO, North Chicago, Ill.

The advent of the automobile has practically eliminated this interesting though not necessarily lucrative business, or possibly better termed "game." In almost every community there were professional horse-traders, who made a rather precarious existence trading horses and in "guile and wile" they were "runners-up" on the famous "heathen Chinee." Even a church deacon quickly and completely discarded, though not visibly, all standards of ethics when it came to a horse-trade. I am sure there are many practitioners, who if they have not had some interesting and amusing horse-trading experiences, can relate some that their clients have told them under pledge of deathless secrecy. We hope that some of the readers of the JOURNAL will relate them, so that we can all enjoy them.

Down in Connecticut they used to hold an annual "Horse Traders' Convention," at Liberty Hill, until it was stopped, unfortunately, by the Humane Society. If some enterprising promoter could have put this Horse Traders' Convention on the road, he would have made a fortune, as a circus would afford no competition.

I got a horse at this convention (never mind what the other fellow got) and if I ever looked a horse over I did this one. He was "guaranteed to be all right every way" but of course, I knew better. The next day his "failing" was apparent. He would stand fairly well while being hitched, but when the lines were picked up or one stepped in the buggy, he would gather himself and make three jumps, of about twenty feet each. If you were not in the buggy you did not go, and if you held him he would "rear up on his hind legs" and it was 50-50 whether he came down forwards or backwards. Various devices and plans were tried to break him of this trait but unsuccessfully. I think they had all been tried many times previously.

One day, I was at a livery stable in a nearby town and was starting for home when this horse went "up in the air." As he stood 17 hands, when he got up he could almost look over the top of the barn. A sympathetic stranger standing near asked, "What makes him do that?" I told him the horse had a cross of carrier pigeon blood in him and before he started for home he wanted to get his bearings. He said, "I'd break him of that." I asked him what he had to trade and we made a deal. Ten days later I saw the man and asked him if he had broken the horse yet. He said, "No, I swapped the d—n cuss off four days ago." Such was life in the "good old days."

PUBLICATIONS RECEIVED

- Rockefeller Foundation. A Review for 1927. George E. Vincent. New York, N. Y., 1928. pp. 54. Illustrated.
- Coccidiosis of Chickens. A. L. Shealy. (Press Bul. 404, Agr. Exp. Sta., Univ. of Fla., Gainesville, Fla., Mar. 1928. pp. 2.)
- Texas, Agricultural & Mechanical College of. Catalog, 1927-28. (Bulletin. Third Series, Vol. 14, No. 4. College Station, Texas, April 1, 1928. pp. 299.)
- Daubenton's Seed Poisoning of Poultry. A. L. Shealy & E. F. Thomas. (Bul. 196, Agr. Exp. Sta., Univ. of Fla., Gainesville, Fla., April, 1928. pp. 8.)
- Ontario Veterinary College, Session 1928-1929, Calendar of the. Guelph, Ont. pp. 52.
- Suggestions on Shipping Hogs in Hot Weather. Michigan Livestock Loss Prevention Association, Detroit, Mich. pp. 3.
- New York State Veterinary College at Cornell University, 1928-1929, Announcement of the. Ithaca, N. Y., May 1, 1928. pp. 32.
- Rabies Prophylaxis. Geo. W. Stiles. Reprint from *Colorado Medicine*, May, 1928. pp. 5.
- Alabama Polytechnic Institute, College of Veterinary Medicine, Announcements for 1928-1929. Auburn, Ala., May, 1928. pp. 21.
- Iowa State College of Agriculture and Mechanic Arts, Division of Veterinary Medicine, Announcement, 1928-1929. Ames, Iowa, 1928.
- Rhodesia, Southern. Report of the Director of Veterinary Research for the year 1927. Salisbury, Rhodesia, 1928. pp. 14.

ASSOCIATION MEETINGS

COLORADO VETERINARY MEDICAL ASSOCIATION

The semi-annual meeting of the Colorado Veterinary Medical Association was held at the Colorado Agricultural College, Fort Collins, May 24-25, 1928. The meeting was quite well attended.

Dr. R. R. Dykstra, of the Kansas State Agricultural College, presented two extremely interesting papers. The first was entitled "Diseases of the Reproductive Organs," presented the morning of the first day. In the afternoon Dean Dykstra presented "Anesthetics in Veterinary Surgery."

Other contributions to the program included "Bovine Mastitis," by Dr. H. E. Kingman, Fort Collins; "Dietetics and Fur Production in Silver Foxes," by Dr. Otis Perrin, Golden; and "The Outlook," by Dr. Geo. H. Glover, Fort Collins.

A short business session was held Thursday afternoon and in the evening the banquet and ball were held at Ammons Hall. The morning of the second day was devoted to a symposium on rabies. This was a joint meeting with the Cattle Feeders, held in the Livestock Pavilion. The afternoon was given over to a clinic.

FLOYD CROSS, *Secretary-Treasurer.*

MICHIGAN STATE VETERINARY MEDICAL ASSOCIATION

The forty-sixth annual meeting of the Michigan State Veterinary Medical Association was held at Michigan State College, East Lansing, June 26-27, 1928.

The meeting started with clinics for both large and small animals. This feature proved to be a good drawing-card. One of the features of the clinic was a demonstration of the use of the emasculatome on calves and rams.

After luncheon, the meeting was called to order by Dr. L. A. Wileden, of Mason, President, and an address of welcome was given by Mr. R. S. Shaw, president of Michigan State College. Dr. B. J. Killham, State Veterinarian, made the response.

Following a brief business session, Dr. R. F. Vermilya, in charge of federal meat inspection at Detroit, presented a very interesting paper, entitled, "Meat Inspection Regulations of

Interest to Practitioners." This paper brought out an unusual amount of discussion and many of the practitioners present put questions to Dr. Vermilya, which he promptly answered. Most of these had to do with emergency slaughter of animals in the country, under quite a variety of conditions.

Mr. Glenn S. Kies, district manager of the Peoria Life Insurance Company, gave an excellent talk, entitled, "Your Profession as the Public Sees It." The discussion of the paper by Mr. Kies was opened by Dr. H. Preston Hoskins, secretary-editor of the A. V. M. A., who suggested that it might have been more appropriate for Mr. Kies' paper to have been entitled, "The Veterinary Profession as the Public Fails to See It." Dr. Hoskins emphasized many of the good points brought out by Mr. Kies and, at the same time, differentiated between a business and a profession, as well as between publicity and advertising.

Immediately following the adjournment of the afternoon session, the members participated in a baseball game, between two very evenly matched teams. These were the "Practitioners" and the "Scientifics," with Dr. W. N. Armstrong, of Concord, officiating as umpire. Up to the time that this report was prepared, the score keepers had not finished their tabulations.

The evening was given over to the annual banquet, with Dr. Ward Giltner acting as toastmaster, in his characteristic fashion. In the neighborhood of 200 veterinarians and their ladies were in attendance at the banquet.

The morning of the second day was devoted to papers. Dr. J. W. Patton, of Michigan State College, presented "Therapeutic Principles" and Dr. E. C. W. Schubel, of Blissfield, read a very interesting paper on the subject of "Field of Poultry Practice."

After luncheon, a paper that had been prepared by Mr. Murray G. Jenkins, a prominent attorney of New York City, on the subject of "Legal Entanglements of the Veterinarian," was read and discussed by Mr. E. C. Smith, a local attorney. This proved to be an outstanding feature of the meeting.

Dr. J. V. Lacroix, editor of the *North American Veterinarian*, very ably discussed small-animal practice in its various phases. He placed special emphasis on the proper hospitalization of canine and feline patients.

The election of officers resulted as follows: President, Dr. W. N. Armstrong, Concord; first vice-president, Dr. John A. Schaefer, Bangor; second vice-president, Dr. E. B. Cavell, Northville; third vice-president, Dr. M. J. Smead, Rochester;

secretary-treasurer, Dr. Edward K. Sales, East Lansing; member of the Board of Directors, for six-year term, Dr. H. Preston Hoskins, Detroit.

Dr. B. J. Killham made a report of progress on the plans for securing the 1929 meeting of the A. V. M. A. for Detroit.

E. K. SALES, *Secretary*.

ILLINOIS STATE VETERINARY MEDICAL ASSOCIATION

The fortieth semi-annual meeting of the Illinois State Veterinary Medical Association was held at East St. Louis, July 5-6, 1928. The first session was called to order by President F. A. Laird at 10:00 a.m. the first day. The minutes of the previous meeting were read and approved.

President Laird then delivered his address, in which he took occasion to remark that in his opinion we have passed the crisis through which the veterinary profession has been going and that the veterinary profession was never more appreciated than it is at the present time. Dr. Laird stated that there could be no permanent agricultural prosperity without healthy live stock and this demanded a veterinary profession to eliminate the hazards of the industry. He especially elaborated on the necessity of the profession accepting the responsibility of maintaining a strictly healthy live stock industry and that this meant all classes of live stock, from the canary bird up, including the dog, cat, sheep, swine, cattle and the horse. Dr. Laird said that the veterinarian who is not qualified to administer properly and intelligently to all these various classes of patients would of necessity be compelled to step aside and make room for the man capable of doing so. Preventive measures through sanitation and immunizing agents were properly stressed and the relationship between the live stock industry and the veterinary profession was clearly drawn. At the conclusion, all felt that they had listened to an address of real intelligent inspiration.

The first topic on the program was "Cattle Practice," presented by Dr. H. J. Schlesinger, of New Athens. The author stressed the gastro-intestinal diseases of cattle, particularly overloading of the rumen, in which he advised pumping in large quantities of water, followed by massage with a two-by-four scantling eight to ten feet long, lifting the abdomen, kneading with the knees from the side and thus assisting in moving the

contents of the rumen. This method may even be used in some instances for dislodging foreign bodies that might otherwise puncture the diaphragm and cause traumatic pericarditis. He sometimes dissolves one to two pounds of Epsom salt in the water to be injected. Drs. H. L. Campbell and L. A. Merillat, in discussing this paper, took occasion to commend the treatment outlined.

"Live Stock Losses Incidental to Transportation" was the topic discussed by Dr. V. W. Myers, of the Western Weighing and Inspection Bureau, National Stock Yards, East St. Louis. Following this paper, the meeting was adjourned for luncheon.

The afternoon session was called to order at 1:30 and Dr. Silas Kempf, of Roanoke, presented a paper, entitled, "A New Method of Treatment for the Septic Uterus." Dr. Kempf's treatment consists of siphoning all fluids from the uterus by means of a catheter, followed by blowing finely powdered boric acid into the uterus by means of compressed air. The apparatus used is simple, consisting of a quart jar, firmly corked, through which runs a long tube reaching nearly to the bottom of the jar and another shorter one that reaches slightly beyond the cork. The jar is filled with boric acid and air is forced through the long tube by means of compression. This balloons the uterus and the boric acid powder reaches all parts. This treatment is repeated daily, or every other day, until the uterus is contracted within the pelvic cavity. A pint is an average amount for a treatment, although any amount may be used safely.

In discussing Dr. Kempf's treatment, Dr. W. H. Welch stated that one must use boric acid in the uterus in order to be able to appreciate properly its great value in this condition. For more than ten years, Dr. Welch has used a capsule containing nothing but pure boric acid for this purpose and he stated that he considered that the efficiency of this drug could not be excelled. All were urged to try the method outlined by Dr. Kempf as a distinct improvement over the well-known capsule method.

Dr. J. A. Owens, of El Paso, presented the next subject, "Results of Blood-Testing All Flocks Contributing Eggs to Hatcheries for Bacillary White Diarrhea." Dr. Owens stated that, first of all, the flocks were culled by state authorities. This was followed by tests for tuberculosis and bacillary white diarrhea. These two tests took about 18 per cent of the flocks. In a number of instances, the owners desired to keep the reactors to the bacillary white diarrhea test in separate quarters, but in-

variably it was found that this procedure did not pay. In one flock of 230 birds, fifty-two were eliminated, only three of which proved to be layers. In one flock, the hatchability of the eggs jumped from 50 to 80 per cent immediately following the test. The pullorin test picked out about 10 per cent more reactors than the agglutination test, as checked at the University of Illinois.

Results on the livability of chicks showed that out of 4,097 chicks leaving the hatchery 3,684 were raised to the broiler stage. Dr. Owens believes that close to 80 per cent of the chicks from this hatchery were raised to the broiler stage. In one instance, where the initial test showed 23 per cent infection and the owner practiced no sanitation, there was trouble, showing that bacillary white diarrhea testing is but one step in the proper direction.

One of the most appreciated numbers on the program was from a former member of the Association, who had moved to Missouri a few years ago, Dr. H. A. Presler, of Hannibal, Mo., who read a paper on "Ethics." This was very highly complimented by his audience, because it contained a series of thoughts that were both instructive and constructive to the profession.

Dr. H. H. Alp, poultry extension specialist, University of Illinois, spoke on "The Results of Poultry Sanitation Work in Illinois." In no phase of animal industry does sanitation return greater dividends than in poultry-raising. Parasitisms and many epizootics can be largely prevented by sanitation, as proven on various poultry farms during the past few years.

"Rabies, Its Status in Illinois" was presented by Dr. A. C. Bolle, of the State Department of Agriculture, Springfield. Many counties at the present time are under quarantine, due to the unusual prevalence of rabies. Traffic in dogs is likewise reduced and efforts are being made to hasten the time when normal conditions will again prevail.

Our old-time friend, Dr. T. A. Sigler, of Greencastle, Ind., ex-president of the American Veterinary Medical Association, was the next on the program with the subject, "Surgery in Veterinary Practice." Surgery in the larger animals has decreased during the past few years, because of the decrease of horse practice. Late graduates are better equipped for operations on small animals and many seem to prefer administering and shy away from all but emergency surgery, which is wrong. Dr. Sigler dwelt on the importance of properly preparing patients

for operations and under no circumstances should any beneficial technic be omitted. The surgeon uncovers disease or exposes his errors. He may depend on nature in the treatment of disease, but knowledge and skill are necessities in surgery. Dr. Sigler covered such conditions and procedures as surgical exploration and treatment of traumatic pericarditis; ligating or tying off the blind pouches of the intestines of turkeys in the treatment of blackhead; volar tenotomy in colts and horses; the French operation for quittor; and so forth.

Dr. L. A. Merillat occupied the remainder of the time with a question-box.

The second day the meeting was called to order promptly at 9:00 a.m. The first number on the program was "Contagious Pyelonephritis," by Dr. H. L. Hanna, of Kinmundy, who described the disease as he had observed it in an outbreak in his locality. This proved to be intensely interesting to all present.

Dr. C. B. Hawes, of Poplar Grove, presented the subject, "Ostertagia Infestation in Cattle." This stomach worm of the ox is minute in size and has doubtless been overlooked by many. The condition, perhaps, is not so unusual as is believed. Dr. Hawes described a large herd in which both tuberculosis and Johne's disease had been suspected. Finally a postmortem revealed the presence of these parasites. Dr. Hawes worked out a treatment consisting largely of copper sulphate solution, which apparently overcame the trouble and the animals returned to normal.

"Poisonous Plants" was the theme under which Professor Albert A. Hansen, of Purdue University, Lafayette, Ind., discoursed for the enlightenment of those present. His subject has probably never been presented better than it was on this occasion. Professor Hansen covered poisoning by snake root, cockle-burr, wild cherry, Jimson weed, Dutchman's breeches, larkspur, sneeze weed, water hemlock, sweet clover, and wild barley or fox tail.

The literary part of the program was brought to a close by Dr. H. A. Wilson, state veterinarian of Missouri. His subject, "The Trend of the Times; Causes; Effects and Results," gave Dr. Wilson an opportunity to deliver one of his typical Wilsonian addresses and he did full justice to the occasion.

The social part of the program included an auto trip to the flying-field for the ladies on Thursday afternoon and a boat trip down the river at night. On this occasion, a moving picture

film was shown, illustrating the manufacture of biologics. The afternoon of the second day, the Association was the guest of the Fairmount Racing Club and all enjoyed the races. One race feature was called "The Illinois Veterinary Association Derby." An excellent paddock cover was provided by the Association for the winner of this race. The winner wore it as he rode past the grandstand, thereby giving our profession some very good publicity.

W. H. WELCH, *Secretary.*

KANSAS CITY ASSOCIATION OF VETERINARIANS

The regular monthly meeting of the Kansas City Association of Veterinarians was held at the Baltimore Hotel, Kansas City, June 20, 1928. The program was devoted to a discussion of swine problems, directed by Dr. A. T. Kinsley, of Kansas City, and a round-table discussion on swine practice, lead by Dr. F. H. Suits, of Odessa, Mo. The meeting was attended by thirty-five veterinarians. The July meeting took the form of a picnic at Fairyland Park, the evening of July 18, 1928.

NORTHEASTERN INDIANA VETERINARY ASSOCIATION

The annual meeting of the Northeastern Indiana Veterinary Association was held at the cottage of Dr. Roy Clark, at Tri-Lake, Ind., June 19, 1928. The meeting was the seventh that has been held at the same place and on the same day each year, to celebrate the birthday of Dr. Clark. Thirty-five were in attendance. Boating and bathing featured the entertainment. A business session was held in the afternoon.

MARYLAND STATE VETERINARY MEDICAL ASSOCIATION

The summer meeting of the Maryland State Veterinary Medical Association was held at the University of Maryland, College Park, July 19-20, 1928, with about sixty members in attendance.

The meeting was called to order by the President, Dr. John P. Turner, of Washington, D. C. In his presidential address, Dr. Turner pointed out that many veterinarians are specializing in small-animal work, often at the expense of the less lucrative but more important large-animal practice in the country. He believes that these veterinarians should be cautioned in regard to such a

procedure, as hard times might become embarrassing, on account of many people not being able to afford to have their pets treated. Dr. Turner also condemned unethical advertising, now being employed in certain cases by men conducting small-animal hospitals. He cited several specific cases.

Mention was made of the encouragement given the profession by the increased appropriations made by Congress during the recent session. The estimate of the Bureau of the Budget was increased over \$189,000 for salaries in the Bureau of Animal Industry. This increase, together with that made available by the Welsh Bill, will raise salaries throughout the Bureau and thus indirectly affect the profession over the whole country. The salary "hump," as it has been termed, was formerly \$2400. It is now \$2800 per year. The entrance salary likewise has been increased from \$1860 to \$2000 per year. This should help to increase matriculation in our veterinary colleges. At present the number of graduates each year will hardly care for the replacements in the Bureau of Animal Industry alone. Nevertheless, Dr. Turner believes that, while officially there is a shortage of veterinarians, the law of supply and demand still obtains and, if a section will appreciate and support a veterinarian, but little trouble will be found in inducing a practitioner to locate where he can render such service.

Dr. Turner recommended the appointment of a publicity committee, for the purpose of bringing certain information to the attention of farmers in an ethical manner. Much advice on methods to be pursued in sanitation and disease prevention could be thus handled most satisfactorily.

Fitting tributes were paid to the splendid service rendered the country and the profession by two prominent veterinarians of Maryland who died the past year. They were Dr. Ernest C. Schroeder and Dr. Gustavus H. Grapp.

Dr. J. W. Hughes, of Ammendale, followed with a case report on "The Treatment of Teat Obstructions in Cattle." This report included several types of cases and was most interesting. In fact it was a most excellent paper on this subject. The use of silver nitrate in many of the cases cited was found to be helpful.

The final paper of the morning was delivered by Dr. John R. Mohler, chief of the U. S. Bureau of Animal Industry. His title was "Infectious Diseases of Live Stock." Contagious abortion and tuberculosis were discussed. This paper was so much

appreciated that it will be published in an early number of the *Cornell Veterinarian*.

The afternoon was devoted to clinics for large and small animals. Dr. D. H. Udall, of Cornell University, was in charge of the large-animal work and Dr. E. B. Dibbell, of Baltimore, conducted the small-animal clinic. Both of these were most interesting and instructive.

The banquet was held at the University Dining Hall in the evening, with sixty-five in attendance. Dr. Maurice C. Hall, of the U. S. Bureau of Animal Industry, acted as toastmaster. The members of the Association now feel that Dr. Hall is as good an after-dinner speaker as he is a scientist and that is saying a good deal. The other speakers merited their share of commendation. They included Dr. A. R. Pearson, president of the University of Maryland; Dr. H. J. Patterson, dean of the Maryland Agricultural College and director of the Maryland Experiment Station; Dr. D. H. Udall, of Cornell University; Dr. E. B. Simonds, in charge of tuberculosis eradication work in Maryland; Dr. Hulbert Young, of Walker Gordon Laboratories, Baltimore; Dr. C. M. Grubb, of Rockville; and others.

The first paper to be presented at the morning session the second day was a case report by Dr. J. B. Koerner, Jr., of Sykesville. The author described two most interesting cases. One was probably necrobacillosis of the liver in a cow and the other was a most unusual chain of periodic indigestions following foaling in a mare.

Dr. R. V. Smith, of Frederick, presented the second paper, which consisted of a series of case reports on cesarean section in the cow. Most of the cases described were not attended until late in labor and much damage had been done by the owners of the cows. Under such conditions, the cases often terminated fatally.

The third paper was presented by Dr. F. W. Miller, veterinarian at the Government Farm, Beltsville. His subject was "Abortion Disease in the Herd." Dr. Miller gave his experience with the disease at the Oregon Experiment Station and at Beltsville. At the latter farm an abortion-free and an infected herd are being maintained. This paper was most instructive. Among other things, Dr. Miller informed us that under their system of management it costs them about six and one-quarter cents more to produce a gallon of milk from the infected herd than it does from the free herd.

procedure, as hard times might become embarrassing, on account of many people not being able to afford to have their pets treated. Dr. Turner also condemned unethical advertising, now being employed in certain cases by men conducting small-animal hospitals. He cited several specific cases.

Mention was made of the encouragement given the profession by the increased appropriations made by Congress during the recent session. The estimate of the Bureau of the Budget was increased over \$189,000 for salaries in the Bureau of Animal Industry. This increase, together with that made available by the Welsh Bill, will raise salaries throughout the Bureau and thus indirectly affect the profession over the whole country. The salary "hump," as it has been termed, was formerly \$2400. It is now \$2800 per year. The entrance salary likewise has been increased from \$1860 to \$2000 per year. This should help to increase matriculation in our veterinary colleges. At present the number of graduates each year will hardly care for the replacements in the Bureau of Animal Industry alone. Nevertheless, Dr. Turner believes that, while officially there is a shortage of veterinarians, the law of supply and demand still obtains and, if a section will appreciate and support a veterinarian, but little trouble will be found in inducing a practitioner to locate where he can render such service.

Dr. Turner recommended the appointment of a publicity committee, for the purpose of bringing certain information to the attention of farmers in an ethical manner. Much advice on methods to be pursued in sanitation and disease prevention could be thus handled most satisfactorily.

Fitting tributes were paid to the splendid service rendered the country and the profession by two prominent veterinarians of Maryland who died the past year. They were Dr. Ernest C. Schroeder and Dr. Gustavus H. Grapp.

Dr. J. W. Hughes, of Ammendale, followed with a case report on "The Treatment of Teat Obstructions in Cattle." This report included several types of cases and was most interesting. In fact it was a most excellent paper on this subject. The use of silver nitrate in many of the cases cited was found to be helpful.

The final paper of the morning was delivered by Dr. John R. Mohler, chief of the U. S. Bureau of Animal Industry. His title was "Infectious Diseases of Live Stock." Contagious abortion and tuberculosis were discussed. This paper was so much

appreciated that it will be published in an early number of the *Cornell Veterinarian*.

The afternoon was devoted to clinics for large and small animals. Dr. D. H. Udall, of Cornell University, was in charge of the large-animal work and Dr. E. B. Dibbell, of Baltimore, conducted the small-animal clinic. Both of these were most interesting and instructive.

The banquet was held at the University Dining Hall in the evening, with sixty-five in attendance. Dr. Maurice C. Hall, of the U. S. Bureau of Animal Industry, acted as toastmaster. The members of the Association now feel that Dr. Hall is as good an after-dinner speaker as he is a scientist and that is saying a good deal. The other speakers merited their share of commendation. They included Dr. A. R. Pearson, president of the University of Maryland; Dr. H. J. Patterson, dean of the Maryland Agricultural College and director of the Maryland Experiment Station; Dr. D. H. Udall, of Cornell University; Dr. E. B. Simonds, in charge of tuberculosis eradication work in Maryland; Dr. Hulbert Young, of Walker Gordon Laboratories, Baltimore; Dr. C. M. Grubb, of Rockville; and others.

The first paper to be presented at the morning session the second day was a case report by Dr. J. B. Koerner, Jr., of Sykesville. The author described two most interesting cases. One was probably necrobacillosis of the liver in a cow and the other was a most unusual chain of periodic indigestions following foaling in a mare.

Dr. R. V. Smith, of Frederick, presented the second paper, which consisted of a series of case reports on cesarean section in the cow. Most of the cases described were not attended until late in labor and much damage had been done by the owners of the cows. Under such conditions, the cases often terminated fatally.

The third paper was presented by Dr. F. W. Miller, veterinarian at the Government Farm, Beltsville. His subject was "Abortion Disease in the Herd." Dr. Miller gave his experience with the disease at the Oregon Experiment Station and at Beltsville. At the latter farm an abortion-free and an infected herd are being maintained. This paper was most instructive. Among other things, Dr. Miller informed us that under their system of management it costs them about six and one-quarter cents more to produce a gallon of milk from the infected herd than it does from the free herd.

The last paper of the morning was delivered by Dr. D. H. Udall. His subject was "Affections of the New Born." Dr. Udall outlined a system of calf feeding which was most instructive. The paper is not reviewed here as it will be published in an early number of the *Cornell Veterinarian*.

The afternoon was devoted to large-animal clinics, conducted by Dr. W. J. Lee, of the University of Pennsylvania.

E. M. PICKENS, *Secretary*.

NEVADA STATE VETERINARY ASSOCIATION

The semi-annual meeting of the Nevada State Veterinary Association was held at Reno, July 20, 1928. Twelve members and two visitors were in attendance. The afternoon was devoted to a clinic, under the supervision of Dr. H. A. Reager, at his hospital and in the field. A variety of interesting material was presented for examination and discussion.

At the evening session, the following literary program was presented:

"Johne's Disease," Dr. L. C. Butterfield, U. S. Bureau of Animal Industry, Reno.

"Some Phases of Dairy Practice," Dr. G. T. Woodward, Fallon.

"Anaplasmosis of Cattle," Dr. W. H. Hilts, State Board of Stock Commissioners, Elko.

Case reports by various members.

The papers presented brought out much interesting discussion. Dr. W. A. Montgomery, of the U. S. Bureau of Animal Industry, located at Reno, was elected to membership.

EDWARD RECORDS, *Secretary*.

NORTHEASTERN ILLINOIS VETERINARY MEDICAL ASSOCIATION

The regular monthly meeting of the Northeastern Illinois Veterinary Medical Association was held at the hospital of Dr. J. C. Wingert, Marengo, July 17, 1928. About thirty-five were present. Dr. B. A. Beach, of the University of Wisconsin, was the principal speaker. He gave a very interesting talk on "Poultry Diseases" and conducted a clinic on a number of diseased fowls. A picnic lunch on the lawn followed the meeting.

The veterinarians of Clinton County (Ill.) met at DeWitt, Ill., July 27, 1928, and organized a county association. Officers were chosen as follows: President, Dr. J. H. Odgers, DeWitt; secretary-treasurer, Dr. R. S. Betts, Lost Nation.

NECROLOGY

PETER CHRISTOPHER JUHL

Dr. Peter C. Juhl, of Prince Bay, Staten Island, N. Y., died April 18, 1928, following a stroke of paralysis two weeks previous.

Born at Langetved, Denmark, May 31, 1853, Dr. Juhl received his veterinary training at the Royal College of Veterinary Surgeons, Copenhagen. He was graduated in 1875, in the same class as Professor B. Bang. Many of those who attended the A. V. M. A. meeting in Philadelphia, one year ago, will recall that these two eminent veterinarians had the great pleasure of renewing their acquaintance for the first time, 52 years after they left college.

Dr. Juhl had many accomplishments to his credit, both within and without strictly professional fields.

A. McMILLAN

Dr. A. McMillan, a graduate of the Ontario Veterinary College, class of 1890, who practiced at Brandon and Oak Lake, Man., for a number of years and later at Dubuc, Sask., was killed in an automobile accident, the early part of June. While located at Brandon, Dr. McMillan was a veterinary inspector under the Animal Contagious Diseases Act.

JAMES MURRAY

Dr. James Murray, of Detroit, Mich., died July 4, 1928. He had been in poor health for some time. Dr. Murray was a graduate of the Detroit Veterinary College, class of 1896, and had practiced in Detroit for over thirty years.

HOWARD WESLEY WILSON

Dr. Howard W. Wilson, of Helena, Arkansas, died July 18, 1928, following an emergency operation for appendicitis.

Born in Chicago, Ill., March 17, 1891, Dr. Wilson attended high school and spent one year at the College of Agriculture, University of Illinois. He then entered the Chicago Veterinary College and was graduated in 1915.

Dr. Wilson practiced first at Gilman, Ill., and while located there entered the Veterinary Corps for service in the World

War. He was stationed at Camp Pike and later Fort Sill. At the close of the war he located at Helena, Ark.

Dr. Wilson joined the A. V. M. A. in 1918 and served as Resident Secretary for Arkansas from 1922 until 1926. He was active in the Arkansas Veterinary Medical Association. He was a member of the Alpha Psi Fraternity.

Surviving Dr. Wilson are his widow, a daughter, one sister and one brother.

JOHN ISAAC HANDLEY

Dr. John I. Handley, of Atlanta, Ga., one of the most widely known veterinarians in the southeastern states, died suddenly, July 23, 1928.

Following his graduation from the Alabama Polytechnic Institute, in 1913, Dr. Handley accepted a position at the North Carolina Agricultural and Mechanical College, West Raleigh. A short time later he went to the Michigan Agricultural College, East Lansing, to accept a teaching position in the Division of Veterinary Medicine. At the outbreak of the World War, Dr. Handley entered the Veterinary Corps and was assigned to the 41st Division, at Newport News, Va. He was ordered overseas and saw active service in France.

After the war Dr. Handley located in Atlanta and organized the Southeastern Laboratories, Inc., of which he was president. He also took a very active part in the Southeastern States Veterinary Medical Association and was serving that organization as secretary-treasurer, for the ninth term, at the time of his death. Dr. Handley was a member of the Alpha Psi Fraternity and was president of the National Council at the time of his death. He joined the A. V. M. A. in 1913 and served as Resident Secretary for Georgia, 1925-1928.

Dr. Handley was in private practice in Atlanta, having severed his connections with the Southeastern Laboratories about a year ago. He possessed considerable executive ability, was a staunch supporter of the veterinary profession in season and out, a tireless association worker, generous to a fault and the kind of a man that everybody liked. He had more than his share of troubles, but these he rarely revealed except to his most intimate friends. Peace be to his ashes.

FRANKLIN ADAMS

Dr. Franklin Adams, of Paris, Ill., was found dead in the Illinois State Hospital, at Kankakee, August 4, 1928, after having been in the institution as a patient for about a week.

Born at Logan, Ill., in 1887, Dr. Adams received his education at Charleston Normal School and the Kansas City Veterinary College. Upon graduation from the latter institution in 1911, he located at Hammond, Ill., later going to Paris.

Dr. Adams joined the A. V. M. A. in 1912. He was a member of the Illinois State Veterinary Medical Association and the Alpha Psi Fraternity. He is survived by his widow, one daughter, three sisters and three brothers.

GLENN B. KIRKWOOD

Dr. Glenn B. Kirkwood, of Woodside, Long Island, N. Y., died August 7, 1928, the result of an abdominal wound inflicted with a knife in the hands of his wife during a jealous quarrel.

Born at Marysville, Kansas, September 28, 1901, Dr. Kirkwood attended high school and the Kansas State Agricultural College. He was graduated in 1923 and entered private practice at Long Island City, N. Y., where he conducted a small-animal hospital.

Dr. Kirkwood joined the A. V. M. A. early this year. He was also a member of the New York State Veterinary Medical Society.

ALBERT E. RISHEL

Dr. A. E. Rishel, senior veterinarian in the Bureau of Animal Industry, died on August 8, 1928, in a Paterson, N. J., hospital, while preparations were being made to perform a surgical operation for some acute intestinal trouble.

Born at Mendon, Michigan, in May, 1865, Dr. Rishel was graduated from the Chicago Veterinary College in 1889, and entered the service of the Bureau of Animal Industry in 1898, at which time he was assigned to meat inspection work at Chicago. In 1903 he resigned, in order to engage in private business, but was later reinstated and in 1904 placed in charge of the meat inspection station of the Department at Los Angeles, Calif. In 1912 he again resigned, but was reappointed in 1913 and ordered to London, England, on duties incident to the tuberculin-testing

of cattle in Great Britain prior to their shipment to the United States. Owing to a practical cessation of live stock shipments following the outbreak of the World War, he was withdrawn from the London post and placed in charge of the Bureau of Animal Industry office at the Customhouse in New York City, handling matters relating to the importation and exportation of live stock and the sanitary control of hides, skins, other animal by-products, feeding materials, etc., entering that port. In 1926 he was assigned to the Animal Quarantine Station for the port of New York, at Clifton, N. J., in addition to his other duties in New York City.

Dr. Rishel was an unusually able administrative officer, having excellent judgment and unlimited energy, combined with tact, a pleasing personality and uniform affability. His death has removed from the service of the Department a most capable and valuable officer.

Dr. Rishel joined the A. V. M. A. in 1910.

J. R. M.

LOUIS EDWARD GROBMAN

Dr. Louis E. Grobman, of Portsmouth, Ohio, died in the Schirman Hospital, August 20, 1928, following two surgical operations. He was in his 48th year. Dr. Grobman was a graduate of the Ohio State University, class of 1912. For several years following his graduation he was a member of the veterinary teaching staff. He then practiced in Cleveland and located in Portsmouth about a year ago. Dr. Grobman was a 32nd degree Mason and a member of the B'Nai Brith. He is survived by his widow, four daughters, his father and four sisters.

PERSONALS

MARRIAGES

Dr. Reimer A. Asmus (Corn. '27), of Troy, N. Y., to Miss Doris May Henry, of Ithaca, N. Y., February 14, 1928.

Dr. Alphonso Collins Newman (Corn. '27), to Miss Doris Eleanor Hammond, both of Westport, N. Y., June 1, 1928, at Westport, N. Y.

Dr. Robert G. Little (U. P. '26), of Williamsport, Pa., to Miss Helen Gertrude Fessler, of Lancaster, Pa., June 15, 1928.

Dr. Munro Sours (Mich. '25), of Tuckahoe, N. J., to Miss Margaret Dannaman, of Mays Landing, N. J., August 4, 1928, at Mays Landing, N. J.

PERSONALS

Dr. Lynuel O. Fish (Ind. '16) has removed from Norman Station, Ind., to Spencer, Ind.

Dr. H. Shepard (S. W. '16), of Killeen, Texas, has located at 1626 Pear St., Dallas, Texas.

Dr. M. L. Boevers (Iowa '24), formerly of Birmingham, Ala., is now located at Lanett, Ala.

Dr. L. Dale Hoag (Iowa '25) has removed from Larchwood, Iowa, to Cherokee, Iowa.

Dr. Kenneth L. Bullis (Iowa '28) has located at DeKalb, Ill. Address: 358 Augusta Ave.

Dr. C. R. Diltz (O. S. U. '04), formerly of Napoleon, Ohio, is now located at Ravenna, Ohio.

Dr. Earl H. Meyer (St. Jos. '23), formerly of Albion, Nebr., has removed to David City, Nebr.

Dr. W. B. Davidson (Ont. '18) has changed locations, going from Windthorst to Estevan, Sask.

Dr. D. R. Cook (San. Fran. '18), formerly of Bakersfield, Calif., is now at Bellevue Ranch, Merced, Calif.

Dr. N. L. McBride (Chi. '14) is a member of the staff of the North Shore Animal Hospital, at Evanston, Ill.

Dr. E. W. Rackley (U. P. '28), formerly of Waynesboro, Ga., has located for general practice at Waycross, Ga.

Dr. S. A. Schneidman (Corn. '15) recently completed a new veterinary hospital at Bellaire, Long Island, N. Y.

Dr. Elvin R. Coon (Ind. '21) has removed from Winamac, Ind., to Logansport, Ind. Address: 709 West Broadway.

Dr. Ben R. Criley (Iowa '28) has accepted a position with the Lederle Antitoxin Laboratories, at Pearl River, N. Y.

Dr. L. H. Dunn (McK. '18) has requested change of address from Newell, S. Dak., to 120 Temple Court, Calixico, Calif.

Dr. F. F. Dowd (Corn. '10) is employed by the Panama Canal Zone Health Department as veterinarian and meat inspector.

Dr. R. B. McCord (Corn. '13), of Northeast, Pa., holds the office of post-master in addition to conducting his private practice.

Dr. J. C. Conway (T. H. '14) has removed from New Goshen, Ind., to Clinton, Ind., where he will engage in general practice.

Dr. H. T. Clarno (Chi. '18), of Farmer City, Ill., received serious injuries recently when he was kicked in the ribs by an unruly cow.

Dr. J. Hubley Schall (U. P. '28) has accepted a position at the Ellen Prince Speyer Hospital for Animals, 350 Lafayette St., New York City.

Dr. H. F. Failor (Ont. '11), of Spencerville, Ohio, has erected an up-to-date veterinary hospital on the property which he purchased recently.

Dr. R. Todd Gregory (McK. '18), formerly of Moundsville, W. Va., has removed to Newport News, Va., and is engaged in general practice there.

Dr. G. S. Harshfield (O. S. U. '16) has been transferred from Cadiz, Ohio, to Alliance, Ohio, where he is engaged in tuberculosis eradication work.

Dr. Frank H. Brown (Ind. '10) was recently re-elected State Veterinarian of Indiana for his third term by the Indiana State Live Stock Sanitary Board.

Dr. Don R. Coburn (Mich. '24) is State Animal Pathologist, with headquarters at the Bacteriology Laboratory, Michigan State College, East Lansing.

Dr. Francis Falls (U. P. '06), who has been resident surgeon at the Veterinary Hospital, University of Pennsylvania, the past year, is now located at Brookline, Pa.

Dr. H. F. Emick (McK. '01), of Indianapolis, has accepted a position with the Indiana State Live Stock Sanitary Board. His work will consist of inspection of poultry flocks for tuberculosis.

Dr. E. F. Sheffield (O. S. U. '22), formerly of Richland, Mich., is now located in Pasadena, Calif., as a field veterinarian with the California State Department of Agriculture, Division of Animal Industry.

Dr. C. J. Johnannes (Ont. '05), of the Health of Animals Branch, Canada Department of Agriculture, was elected president of the Saskatchewan Guernsey Breeders Club at a meeting held in Saskatoon on July 27.

Dr. C. B. McGrath (Iowa '23) has resigned his position with the Nebraska Bureau of Animal Industry, and will enter private practice at Onawa, Iowa. Dr. McGrath was engaged in scabies eradication in the Nebraska sandhills region when he resigned.

Dr. E. C. McCulloch (K. S. A. C. '24), who has been associated with Dr. Robert Graham (Iowa '10), in the Department of Animal Pathology and Hygiene, University of Illinois, has accepted a position at the Alabama Polytechnic Institute, Auburn, Ala.

Dr. Reuben Gordon (Corn. '25) of Patchogue, N. Y., opened a modern small-animal hospital, on the Montauk Highway, about three-quarters of a mile from the center of the village. The architecture is of the English cottage type, with brick front and stucco sides.

Dr. W. A. Benson (Corn. '18) has been employed for the past five years as Health Officer of the city of Daytona Beach, Fla. He has charge of mosquito control, dairy, food and meat inspection and is allowed to do a small amount of private practice outside of business hours.

Dr. E. L. Kittrell (K. C. V. C. '17), of Augusta, Ark., has a horse which he wants to enter in the "Channel Swim." Dr. Kittrell reports that, during the recent flood, he had a thirty-year-old horse which got in the river and swam ten miles. The horse came out apparently no worse for the strain.

Dr. H. C. Crawford (U. P. '09), who was for a number of years associated with the late Dr. Robert W. McCully, of New York City, has removed from Jamaica to Bellerose, which is in close proximity to Belmont Park, the Thoroughbred training center and winter quarters of Long Island.

JOURNAL
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(Original Official Organ U. S. Vet. Med. Ass'n.)

H. Preston Hoskins, Secretary-Editor, 716 Book Building, Detroit: Mich.

T. E. MUNCE, President, Harrisburg, Pa.

M. JACOB, Treasurer, Knoxville, Tenn.

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Reprints should be ordered in advance. Prices will be sent upon application.

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October, 1928

No. 6

THE MINNEAPOLIS PROCEEDINGS

This number of the JOURNAL is devoted almost exclusively to the publication of the proceedings of the recent meeting in Minneapolis. It would be well worth the while of every member of the A. V. M. A. to read every word of the proceedings from beginning to end. This is particularly true of those 3000 or more members who were denied the privilege of attending the Minneapolis meeting. Even those who were in attendance and heard the several addresses and numerous committee reports would do well to go over the proceedings slowly and digest what is presented in these addresses and reports, as well as the discussions in connection therewith.

The publication of the proceedings of our annual meetings offers the very best opportunity for members to become acquainted with what the national organization is actually doing. Even those members who are in the habit of perusing the JOURNAL carefully, from month to month, do not have an opportunity to familiarize themselves sufficiently with the varied activities and ramifications of the A. V. M. A. Much of the work is done quietly and without any pretense at ostentation. We know of organizations whose officers seem to feel that it is absolutely necessary for them to keep tooting their own horns for the purpose of directing attention to what these organizations are doing. In other cases it seems to be the policy to say what is going to be done and then do very little of it. On the other hand, it appears

to be the pretty well-grounded policy of the A. V. M. A. to go ahead and do things and then gracefully make a report of what has been done. We believe that our members will agree that, after all, our present policy is the only one for us to pursue. Therefore, if any member desires to know just what the officers and committees have accomplished during the past year, all that he has to do is to sit down and read the various reports, made to the Association by these officers and committees, at our recent meeting in Minneapolis.

We believe that any member who does this will agree that the A. V. M. A. is awake to any condition that in any way involves or has its effect upon the veterinary profession as a whole or veterinarians individually. We repeat that it would be well worth while for every member of the A. V. M. A., no matter in what branch of the profession he is engaged, to make it a point to acquaint himself with everything that has been done by the A. V. M. A. the past year, as set forth in the proceedings of the Minneapolis convention.

As this is being written, it looks doubtful whether we will be able to include in this number of the JOURNAL everything that we had originally planned to publish this month. It now seems likely that we will be compelled, on account of lack of space, to put over until the November issue, the publication of the transactions of the four sections at Minneapolis, the reports of the different alumni meetings held the first evening of the convention, as well as a report of the clinics held at University Farm on Friday. We have been promised such a report, the same to be prepared by Doctors Fitch and Boyd, the two men who had so much to do with making the clinic such a grand success. We also expect to publish a report of the annual meeting of the Women's Auxiliary. President Munce has promised to provide us with a list of all of his committee appointments for early publication.

THOMAS EDWARD MUNCE, V. M. D.

Dr. T. E. Munce, the subject of this biographical sketch, is the forty-ninth president of the American Veterinary Medical Association. No one was ever elected to this office with better qualifications. In addition to possessing demonstrated executive ability, Dr. Munce is intimately familiar with the affairs of the national organization, the result of ten years of continuous service as a member of the Executive Board.

Born April 26, 1877, on his father's farm in South Strabane Township, Washington County, Pennsylvania, Dr. Munce attended country school until the spring of 1889, when the family moved to Washington, Pa. Here he attended the city public schools and then entered Washington and Jefferson College, which he attended until 1896. He spent the years from 1896 to 1901 on the home farm and the farms of his brothers, assisting in breeding and raising pure-bred live stock and in general farming.

Attracted by the possibilities of the veterinary profession as a life work, Dr. Munce looked over the various veterinary educational institutions of the country and decided to enter the University of Pennsylvania. He made an unusually good record as a student and his class honored him with the presidency during his senior year. He was graduated in June, 1904, and one of the first things he did, upon receiving his diploma, was to file an application for membership in the A. V. M. A. It is rather an interesting coincidence that Dr. Munce will complete his year as president of the A. V. M. A. at the same time that he will complete twenty-five years of membership in the organization.

Following his graduation and passing his state board examinations, Dr. Munce located at Washington, Pa., and engaged in a general practice there. He remained in Washington until July, 1907, when he was appointed, by the Governor of Pennsylvania, as one of the original meat hygiene agents of the Pennsylvania State Live Stock Sanitary Board, under the direction of the late Dr. Leonard Pearson, then state veterinarian. Dr. Munce was engaged in the state meat hygiene service as well as general field work for one year, when he was called to Harrisburg, in July, 1908, as special assistant to Dr. Louis A. Klein, who was then deputy to Dr. Pearson in the state regulatory work.

In the outbreak of foot-and-mouth disease in 1908, Dr. Munce took an active part in its eradication in Pennsylvania. In November, 1909, he was appointed, by the Governor, to succeed Dr. Klein as Deputy State Veterinarian. He continued in the service of the Pennsylvania State Live Stock Sanitary Board until September, 1919, when he was appointed State Veterinarian and Director of the Pennsylvania Bureau of Animal Industry, a position which he still holds with much distinction to himself and the profession in Pennsylvania.



THOMAS EDWARD MUNCE, V. M. D.
President of the American Veterinary Medical Association
1928—1929

Dr. Munce has always been active in organization work. He served as president of the Pennsylvania State Veterinary Medical Association for the year 1915-1916. Following his year as president he served the same organization as secretary for two years. In 1921 he was elected to the presidency of the United States Live Stock Sanitary Association. In the A. V. M. A. Dr. Munce served as the first secretary of the Section on Sanitary Science and Police (1916-1917) having been appointed by President C. E. Cotton. In 1918 he was elected a member of the Executive Board to represent Executive Board District No. 2. He served as chairman of the Local Committee on Arrangements for the Philadelphia meeting of the A. V. M. A. in 1918.

Dr. Munce is a director of the First Bank and Trust Company of Washington, Pa. He is a member of the Rotary Club and the University Club, of Harrisburg, and of the Harrisburg Chamber of Commerce. He is a member of the following Masonic bodies at Washington, Pa.: Lodge 164, Chapter 154, Council No. 1; Knights Templar, Commandery No. 3; also Consistory and Syria Temple, Mystic Shrine, at Pittsburgh, Pa.

Dr. Munce has attended every annual convention of the A. V. M. A. since 1916 (Detroit). It is also a matter of record that he has attended every regular and special meeting of the Executive Board of the A. V. M. A. since he has been a member of the Board, a record of which he can well be proud.

Few veterinarians are as well posted as Dr. Munce, as far as the different branches of the veterinary profession are concerned. He has seen general practice and fully appreciates the difficulties under which the general practitioner frequently has to work. His record as a regulatory official in Pennsylvania speaks for itself and it is a well-known fact that the practicing veterinarian is made a working part of any animal disease control measure that is put in force in the Keystone State. Dr. Munce has maintained a deep interest in veterinary education at all times and this interest is manifest by his frequent visits to his Alma Mater. The faculty of the Veterinary School of the University of Pennsylvania would not even think of undertaking any important move without the counsel of Dr. Munce. He is equally interested in the purely scientific aspect of veterinary medicine. He does not underestimate the value and importance of research work in animal diseases and the best evidence of this is the provision which has been made by the Pennsylvania Bureau of Animal

Industry for engaging in research work in a number of the more important animal diseases.

One of our old teachers used to have the habit of asking his students to give him a word that would be particularly appropriate to be applied to something he was talking about. The word might be an adjective one time, a noun some other time, or a verb on some other occasion. If we were asked to give an adjective that would be especially appropriate to describe Dr. Munce, particularly insofar as the veterinary profession is concerned, we believe that we would propose the word "forward-looking." Such an attribute has never been so valuable as it is at the present time, when the veterinary profession is going through such drastic changes. The veterinarian who does not look ahead and plan for the future is very likely to be left behind. Dr. Munce constantly has an eye on the future.

APPLICATIONS FOR MEMBERSHIP

(See May, 1928, JOURNAL)

FIRST LISTING

CARROLL, FLOYD EUGENE

Box 251, Faculty Exchange, Texas A. & M. College, College Station, Tex.

D. V. M., Kansas State Agricultural College, 1928

Vouchers: H. Schmidt and Mark Francis

CONRAD, H. P.

R. R. 3, Port Huron, Mich.

D. V. M., Michigan State College, 1921

Vouchers: H. Preston Hoskins and B. J. Killham.

GWALTNEY, JOHN S.

14 Willow St., Potsdam, N. Y.

D. V. M., Indiana Veterinary College, 1921

Vouchers: David F. Deming and C. R. Guile.

HEACOCK, C. C.

Rapid City, S. Dak.

V. S., Ohio State University, 1903

Vouchers: J. O. Wilson and G. W. Gronen.

ISHAM, RUSSELL R.

124 Auburn Ave., Auburn, Wash.

D. V. S., Washington State College, 1921

Vouchers: George W. Clark and C. E. Sawyer.

KELLY, PATRICK J.

8326 12th St. Detroit, Mich.

B. V. S., Ontario Veterinary College, 1925

Vouchers: E. E. Patterson and H. Preston Hoskins.

LARUE, IRVING G.

Dept. of Agriculture, Sacramento, Calif.

D. V. M., McKillip Veterinary College, 1916

Vouchers: A. C. Rosenberger and J. P. Iverson.

THOMAS, OWEN ELLIS

Willard, Ohio

D. V. M., Ohio State University, 1928

Vouchers: D. M. Swinehart and W. E. Clemons.

THORESON, M.

Mayville, N. Dak.

D. V. M., Ohio State University, 1921

Vouchers: H. L. Foust and W. F. Crewe.

TURLA, FAUSTINO F.

169 Nagtahan, Manila, P. I.

D. V. M., University of the Philippines, 1922

Vouchers: Vicente Ferriols and S. Youngberg.

Applications Pending

SECOND LISTING

Abramson, Alexander Henry, 639 Buchanan Place, West New York, N. J.
Allen, Stanley W., Watertown, S. Dak.
Ball, Leroy C., Tipton, Iowa.
Banks, C. H., Tipton, Iowa.
Bennett, Arch W., 2729 Coral St., Sioux City, Iowa.
Bilden, Leonard Melvin, Northwood, N. Dak.
Bjornson, Benedict K., Mandan, N. Dak.
Blake, Arthur Lee, 2622 Washington Ave., Sioux City, Iowa.
Bloemers, John D., 121 Seventh Ave. S., South St. Paul, Minn.
Bratager, C. B., c/o Morrell & Co., Sioux Falls, S. Dak.
Brolling, 1014 13th Ave. S., Fargo, N. Dak.
Brooks, John Mullett, 1823 Mackinaw St., Saginaw, S. W., Mich.
Bryan, H. E., Angola, Ind.
Buck, John O., Hills, Minn.
Cameron, F. R., Hawley, Minn.
Casey, Patrick H., Farmington, Minn.
Catlin, Orris I., Moorhead, Minn.
Chapman, George W., Webster, S. Dak.
Chase, Dennis H., Manchester, Ohio.
Combs, Lawrence Glenn, Corozal, Canal Zone.
Cornell, William A., 1605 St. Aubin St., Sioux City, Iowa.
Cox, John L., 432 11th St., Toledo, Ohio.
Curry, Hugh Edward, United Serum Co., Wichita, Kans.
Dorman, George M., 3600 Sixth Ave., Sioux City, Iowa.
Durham, Jesse W., 329 Eighth Ave. S., Fargo, N. Dak.
Ebright, Glenn L., 214 Fayette St., Hammond, Ind.
Ellis, Willis V., 1207 S. Cecelia, Sioux City, Iowa.
Erickson, E. B., Pelican Rapids, Minn.
Erickson, Henry E., 299 W. University Ave., St. Paul, Minn.
Fiege, Harvey J., 3804 Sixty-third St., Kenosha, Wis.
Gabriel, Marie, Institut Agricole d'Oka, La Trappe, Que.
Gettleman, George A., Hartford, Wis.
Gidley, Thos. W., Malvern, Iowa.
Gisel, Emil O., 1126 Cornelia St., Sioux City, Iowa.
Hadley, L. M., Ruthven, Iowa.
Hatterscheid, C. A., Glendive, Mont.
Helmer, H. O., Cooperstown, N. Dak.
Heusinkveld, Mark, 4816 Morningside Ave., Sioux City, Iowa.
Hoffman, Asa A., Box 299, Detroit Lakes, Minn.
Hollecker, Edward B., 600 N. 17th St., Kansas City, Kans.
Howell, Martin Elmer, 413 N. Prairie Ave., Sioux Falls, S. Dak.
Jarvis, King C., Dept. of Agri., Capitol Bldg., Sacramento, Calif.
Johnson, Chester Lawrence, Harvey, N. Dak.
Kemen, Mathias John, 722 State Office Bldg., Lansing, Mich.
Kletti, Alvin J., Slinger, Wis.
LaFayette, Walter W., 2543 S. Cypress St., Sioux City, Iowa.
Laird, W. R., Sioux Falls, S. Dak.
Lauderdale, Byron Newman, Box 364, Madison, Fla.
Lewis, Gaylord T., 7121 Oklahoma Ave., Cincinnati, Ohio.
Lindquist, W. E., 2841 30th Ave. S., Minneapolis, Minn.
Linnemann, Martin C., St. Joseph, Minn.
Lowe, John H., c/o Dr. J. W. Murdoch, Capitol Sta., Helena, Mont.
Mayer, Nelson J., Box 680, Mitchell, S. D.
McBain, William E., Jr., 3829 Hazelhurst, Toledo, Ohio.
McKenzie, Peter, Aneta, N. Dak.
McKenzie, Wraith H., 138 Chittenden Ave., Columbus, Ohio.
McLaughlin, Edward Joseph, P. O. Box 335, Salisbury, Md.
Mehan, Joseph A., 351 E. New St., Lancaster, Pa.

Melvin, V. W., 3944 Almeda Drive, Toledo, Ohio.
 Metcalf, Carl V., 1310 Lincoln Ave., St. Paul, Minn.
 Mikolai, Ignatius E., Wells, Minn.
 Miller, Leon E., 1732 Arlington, Toledo, Ohio.
 Neeley, Samuel Wright, 325 E. Broadway, Toledo, Ohio.
 Nelson, Frank M., Box 43, Livingston, Mont.
 Noller, Otto William, 6th & Gage Sts., Topeka, Kans.
 Oakes, G. H., Hunter, N. Dak.
 Painter, G. G., Jackson Center, Ohio.
 Parshall, Charles Jonas, 1130 N. 13th St., Fargo, N. Dak.
 Peterson, William Langdon, 336 E. Lafayette St., Stockton, Calif.
 Quelland, John D., 272 Filmore Ave., Pierre, S. Dak.
 Rajotte, Arthur, Drummondville, Que.
 Rawn, Edward, Luck, Wis.
 Reihart, O. F., 4802 S. 25th St., South Side Sta., Omaha, Nebr.
 Richards, H. S., 210 Swope St., Pittsburgh, Pa.
 Roderick, Lee M., State College Station, Fargo, N. Dak.
 Sanders, Ellmore Franklin, Massachusetts Agricultural College, Amherst, Mass.
 Sass, Clarence William, 827 Colburn St., Toledo, Ohio.
 Saunders, Francis Harold, 336 E. Lafayette St., Stockton, Calif.
 Schlegel, John O., 3600 6th Ave., Sioux City, Iowa.
 Schneider, Ernest, 914 7th St., Bismarck, N. Dak.
 Scott, John R., Highmore, S. Dak.
 Slocum, Arthur E., c/o Govt. Office, John Morrell & Co., Sioux Falls, S. Dak.
 Smith, Edwin Reed, Fort Meigs Hotel, Toledo, Ohio.
 Spayth, Guy V., Bloomville, Ohio.
 Sprague, A. W., 3079 S. 32nd St., Omaha, Nebr.
 Stille, Louis E., Greenleaf, Kans.
 Stromlund, Ernest V., 3334 Orleans Ave., Sioux City, Iowa.
 Terry, Edward Everett, 3603 Welsh Rd., Holmesburg, Philadelphia, Pa.
 Vollmer, Carl G., R. F. D. No. 8, West Toledo, Ohio.
 Walsh, A. L., Thief River Falls, Minn.
 Wetter, Charles H., Princeton, Minn.
 Whealy, J. A., 408 N. Euclid Ave., Sioux Falls, S. Dak.
 Williams, Charles, Sisseton, S. Dak.
 Wirthlin, John R., 719 Julia Place, South Jacksonville, Fla.
 Wrinkle, Ellery, P. O. Box 366, Oakdale, Calif.
 Zenor, Perry, 2811 S. Cecelia St., Sioux City, Iowa.

REINSTATEMENT

Herrington, Howard J., 1130 Franklin Ave., Lexington, Mo.

The amount which shall accompany an application filed this month is \$6.25, which covers membership fee and dues to January 1, 1929, including subscription to the JOURNAL.

COMING VETERINARY MEETINGS

New York City, Veterinary Medical Association of. Academy of Medicine, 5th Ave. & 103rd St., New York, N. Y. October 3, 1928. Dr. C. P. Zepp, Secretary, 128 W. 53rd St., New York, N. Y.

San Diego-Imperial Veterinary Medical Association. San Diego, Calif. October 3, 1928. Dr. W. G. Oliver, Secretary, 3821 Arizona St., San Diego, Calif.

Chicago Veterinary Society. Great Northern Hotel, Chicago, Ill. October 9, 1928. Dr. J. B. Jaffray, Secretary, 2956 Washington Blvd., Chicago, Ill.

- Southeastern Michigan Veterinary Medical Association. Detroit, Mich. October 10, 1928. Dr. H. Preston Hoskins, Secretary, 716 Book Bldg., Detroit, Mich.
- Maine Veterinary Medical Association. DeWitt Hotel, Lewiston, Maine. October 10, 1928. Dr. C. F. French, Secretary, 87 Summer St., Rockland, Me.
- Ontario Veterinary Association. Ontario Veterinary College, Guelph, Ont. October 10-11, 1928. Dr. H. M. LeGard, Secretary, 223 Main St. N., Weston, Ont.
- Kansas City Association of Veterinarians. New Baltimore Hotel, Kansas City, Mo. October 16, 1928. Dr. J. D. Ray, Secretary, 400 New Center Bldg., Kansas City, Mo.
- Pennsylvania State Veterinary Medical Association. Laboratory, Pennsylvania Bureau of Animal Industry, Harrisburg, Pa. October 16-17, 1928. Dr. H. R. Church, Secretary, Harrisburg, Pa.
- Southern California Veterinary Medical Association. Chamber of Commerce Bldg., Los Angeles, Calif. October 17, 1928. Dr. W. L. Curtis, Secretary, 1264 W. 2nd St., Los Angeles, Calif.
- Eastern Iowa Veterinary Association. Hotel Montrose, Cedar Rapids, Iowa. October 17-18, 1928. Dr. J. B. Bryant, Secretary, Mr. Vernon, Iowa.
- Purdue University Veterinary Short Course. Lafayette, Ind. October 30-November 2, 1928. Dr. R. A. Craig, Purdue University, Lafayette, Ind.
- Connecticut Veterinary Medical Association. Danbury, Conn. November 7, 1928. Dr. E. H. Patchen, Secretary, Milford, Conn.
- Hudson Valley Veterinary Medical Society. Poughkeepsie, N. Y. November 14, 1928. Dr. J. G. Wills, Secretary, 122 State St., Albany, N. Y.
- Missouri Valley Veterinary Association. Kansas City, Mo. November 20-22, 1928. Dr. E. R. Steel, Secretary, 8023 Wornall Rd., Kansas City, Mo.
- National Association of Bureau of Animal Industry Veterinarians. LaSalle Hotel, Chicago, Ill. December 5-7, 1928. Dr. J. S. Grove, Secretary, 1715 Belmont Avenue, Fort Worth, Texas.
- United States Live Stock Sanitary Association. LaSalle Hotel, Chicago, Ill. December 5-7, 1928. Dr. O. E. Dyson, Secretary, 45 Live Stock Exchange Bldg., Wichita, Kans.

ARMY VETERINARY SERVICE

CHANGES RELATIVE TO VETERINARY OFFICERS

The appointment of 2nd Lieutenant Maurice Wendell Hale, as second lieutenant in the Veterinary Corps, Regular Army, with rank from July 24, 1928, is announced. Lt. Hale will proceed to Washington, D. C., reporting upon arrival to the Commandant, The Army Veterinary School, for duty, for the purpose of pursuing a course of instruction.

Second Lieutenants Harry R. Leighton, Verne C. Hill, and Elmer W. Young, V. C., promoted to grade of 1st lieutenant, August, 1928.

Reserve Corps

New Acceptances

Ellis, Harvie R. 2nd Lieut. Tyler, Texas.

Promotions

McKibbin, Robert W., 216 W. Second Street, Waynesboro, Pa., to grade of captain.

Separations

White, Walter G.	Major.	Declined reappointment.
Ward, Thomas V.	1st Lt.	Declined reappointment.
Aidman, George E.	2nd Lt.	Appointment terminated 6-11-28.
Bratager, C. B.	2nd Lt.	Failed to accept reappointment.
Dunn, L. H.	2nd Lt.	Failed to accept reappointment.
Graff, Carl P.	2nd Lt.	Failed to accept reappointment.
Hall, F. A.	2nd Lt.	Failed to accept reappointment.

BUREAU TRANSFERS

Dr. Harry A. Schneider (U. P. '06) from Baltimore, Md., to Frederick, Md., in charge of meat inspection.

Dr. Wm. F. Osborn (K. C. V. C. '08) from Frederick, Md., to Baltimore, Md., on meat inspection.

Dr. Ocie Carter, Jr., from Chicago, Ill., to Frankfort, Ky., on hog cholera control.

Dr. George McCollister (O. S. U. '13) from Frankfort, Ky., to Oklahoma City, Okla., on meat inspection.

Dr. Willard H. Wright (Geo. Wash. '17) from College Park, Md., to Beltsville, Md. (Zoological Division)

Dr. Harry P. Waddle (K. C. V. C. '10) from Suffolk, Va., to Jackson, Miss., on tick eradication.

Dr. Harry W. Willis (Colo. '12) from Tallahassee, Fla., to Little Rock, Ark., on hog cholera control.

Dr. I. Newton Habecker (McK. '08) from Des Moines, Iowa, to Springfield, Ill., on hog cholera control.

Dr. M. M. Woods (U. S. C. V. S. '18) from Mason City, Iowa, to Fargo, N. Dak., on meat inspection.

Dr. Fred J. Wolma (Chi. '11) from Fort Worth, Texas, to Des Moines, Iowa, on hog cholera control.

Dr. Carl F. Stroehlein from Chicago, Ill., to Cincinnati, Ohio, on meat inspection.

Dr. Norman C. Wheeler (Chi. '11) from Cincinnati, Ohio, to Dayton, Ohio, on meat inspection.

Dr. James H. Coleman (U. S. C. V. S. '27) from Montpelier, Vt., to Boston, Mass., on meat inspection.

AMERICAN VETERINARY MEDICAL ASSOCIATION
Proceedings of the Sixty-fifth Annual Meeting, Minn-
neapolis, Minnesota, August 7 to 10, 1928

TUESDAY MORNING, August 7, 1928

The first general session of the sixty-fifth annual meeting of the American Veterinary Medical Association, held at the New Nicollet Hotel, Minneapolis, Minn., August 7-10, 1928, convened at 10:40 a. m., Dr. Reuben Hilty, of Toledo, Ohio, presiding.

PRESIDENT HILTY: I now declare in session the sixty-fifth annual meeting of the American Veterinary Medical Association.

As should be, we will be led in prayer by the Reverend C. E. Haupt, pastor of St. Matthews Episcopal Church.

REV. C. E. HAUPT: O God Almighty and Eternal Father, at the beginning of days, from everlasting to everlasting, for Whom angels and men bow in wondering adoration and call Thee by the endearing name of Father, we come into Thy presence to offer the homage of grateful hearts and lips for the blessing bestowed upon us.

We thank Thee for this fair land of America. We thank Thee for the intelligence Thou hast given us. We thank Thee for life and health and all those good things we enjoy, most of all for the revelation of Thyself in the beauty of holiness, in the presence of Jesus Christ, our Savior.

We thank Thee that Thou has bestowed dominion over the fish of the sea, the birds of the air, beasts and cattle and everything that creepeth.

We invoke thy blessing on this gathering. Guide us, we beseech Thee, with Thy divine wisdom. Yield to us the will to make us faithful in the discharge of every duty. We pray Thee, O Father, enable us to use our dominion over the lower animals.

We thank Thee for the advancement of medical science and for the splendid progress which has been made. We thank Thee that Thou has enabled us to use our dominion for the relief of animal pain and for the amelioration of human despair.

We beseech Thee that Thou enable this community to recognize and appreciate the splendid work these men are doing and enable us to go forward for the extension of the kingdom to the honor of Thy name.

Bless those that are to address this assembly and those that are to listen. Grant all these things for the sake of Jesus Christ, our Savior, in whom we glory. Amen.

PRESIDENT HILTY: We have an unusual treat this morning. It is very seldom that we can induce the governor of a state to address our meetings, but this morning we are particularly fortunate in having the governor of this state to address us.

I have the pleasure of introducing to you Honorable Theodore Christianson, Governor of Minnesota.

The audience arose and applauded Governor Christianson.

GOVERNOR CHRISTIANSON: Mr. Chairman, Members of the American Veterinary Medical Association, Ladies and Gentlemen: I am rather surprised at the statement that was just made by the Chairman. He said that it is very seldom a governor of a state addresses your Association. I assumed that in most states the governors made most of the speeches, Mr. Chairman. (Laughter)

I recall distinctly about three years ago, when the governors of the various states held their annual conference at Poland Springs, Maine, Governor Al Smith, of New York, made the remark that every American state ought to have at least two governors. He said that one of them ought to be on the job, and I assume that perhaps I should be there this morning. He said that the state should buy the other one a celluloid collar and a dinner coat and send him out to make all the speeches and lay all the cornerstones, and attend all of the conventions. I might say that one of my principal duties in the state of Minnesota is to dedicate new creameries. (Laughter and applause)

I usually have to talk for my luncheon every noon and for my dinner every night. If I could get somebody to introduce the vogue of after-breakfast speaking, I would be entirely independent of the good lady who is my wife. I don't know what there is about a popular election that qualifies a man to talk all the time. Of course I believe in popular elections because I happen to be the product of one, but I don't know what there is about a popular election that would qualify a man to talk incessantly and frequently and lengthily and eloquently, and they even expect a man to talk intelligently (laughter) upon every conceivable subject, from the proper feeding of infants to the settlement of the inter-allied war obligations. (Laughter)

A few months ago, in a rural county in the southwestern part of this state, they even made me the judge at a hog-calling contest. (Laughter) There were three of us judges. We decided we believed in the principle of division of labor. As it happened that one of the judges was a Twin City clergyman, and the second one a local state senator, and the third the governor of the State, we decided we would divide the job in this way: To the Twin City clergyman we assigned the task of judging the hog-calling from the standpoint of musical tone. To the local state senator, being a politician, we assigned the task of judging it from the standpoint of its effect upon the audience, and to me was assigned the task of judging it from the standpoint of the effect upon the hog. (Laughter).

It is said that many years ago when electric cars were first introduced in the city of New Orleans, a certain colored man was heard to remark, "Lawdy, those Yankees came down here to free the niggers, and now they have come here to free the mules." (Laughter)

We are not using as many horses and mules as we did a few years ago, and that has caused an evolution, I assume, in your profession. You are no longer horse doctors, you are veterinary physicians and surgeons.

Great changes have taken place in many of the professions during the last few decades. The old empirical methods have been abandoned, and the professions have been put upon a sound and scientific basis. Your own profession requires a long, strict and arduous period of study for its preparation, and that is as it should be, because it has raised your group to the dignity of a true profession, standing alongside of the professions of law, the ministry and medicine.

I am glad to be here this morning, for the purpose of welcoming you to the state of Minnesota, because you represent not only an honorable and dignified profession, but you play an important part in the life of every community.

There are not very many veterinary surgeons in the United States. I was surprised to find that there are only about 12,000 in the United States and Canada; that is there were in 1924. I learned that about 600 drop out because of death or retirement every year, and that the first-class veterinary colleges of the United States and Canada are graduating only 150 new ones every year to enter your profession. Apparently, at the present rate, the members of your profession are dwindling. There is no

reason why the number should be reduced, because I believe, despite the fact that we have resorted to the automobile and to Fords for transportation, and are relegating the horse very much for that purpose, that new fields of activity are opening up for the veterinary profession, which gives to it a position of usefulness such as it has never had in the past.

About five per cent of the members of your profession are engaged in teaching and research work. There are fifteen per cent of them engaged at the present time in the work of sanitation, while eighty per cent are engaged in the practice of veterinary medicine. I assume, if I may be permitted to judge from the tendencies of the time, that the numbers engaged in research and in sanitation are going to increase from year to year, because in veterinary medicine, as in other forms of medicine, the value of the research man is being enhanced, and perhaps the value of the man who confines himself to the treatment of individual cases is becoming less important.

There was a time when human disease was considered an individual matter. It has ceased to be that because disease today is a social concern. The doctor of today not only treats the individual patient for a specific and individual malady—that work, to be sure, is a wonderful work and one of the most valuable works that a man can do—but he would consider that his profession were meeting only a part of its responsibility to the public if he confined himself to the treatment of individual cases of disease. Today he sets himself to the task of preventing the spread of contagion. Disease has become a social menace, to be met by social action. Your profession has gone even a little farther than that because you concern yourself not only with the prevention of the spreading of infection, which may cause disease in human beings as well as among the animals, but you are also concerning yourself with destroying the sources of infection, and thus annihilating and wiping out the disease.

For these reasons, members of the veterinary profession, I am glad to welcome you this morning as partners of the state in the great work of social amelioration.

I hope that the proceedings of your convention will not only be profitable but pleasurable, and I dare to express the hope that after your proceedings are over some of you will tarry a while in the state of Minnesota and learn to know our people, because if you do, I think you will learn to know them better and to like them better.

I would like to have some of you sojourn a while at one of our 10,000 lakes. We have a limit, of course, upon the number of fish that you may legally catch, but there are plenty of fish up there to meet that limit.

Speaking about 10,000 lakes, I believe, as Governor of this state, I ought to be frank this morning and tell you, ladies and gentlemen, confidentially, that that is more or less of a figure of speech, because the exact number of lakes in Minnesota does not happen to be 10,000, as some of you may have suspected. We don't want to be like our neighbors from certain other states that I am going to be charitable enough not to mention this morning. (Laughter) We don't want to mislead you in any particular, so I believe it is my duty to be frank and tell you right here and now that the exact number of lakes in Minnesota is not 10,000, because, Mr. Chairman, we have 11,000 lakes in Minnesota. (Laughter and applause)

We want you to become acquainted not only with our esthetic values, but we want you to become acquainted with our industry and our agriculture as well.

God has been very good to us in that He has placed us in this marvelous agricultural region embracing so much of the Mississippi Valley, one of the largest areas of contiguous fertile agricultural lands upon the entire planet, perhaps the largest except that of interior Russia which has produced wheat with undiminished returns for more than 500 years.

Upon the farms of Minnesota we have 1,500,000 dairy cows, all of them potential patients for members of your profession. We are carrying on the work of eradicating tuberculosis on the area plan in the state of Minnesota, and we are going to continue to carry that on until we have stamped out tuberculosis from the herds of this state. (Applause) We need to do that because we want to preserve our position as the premier dairy state of America.

Last year we produced \$170,000,000 worth of dairy products in the state of Minnesota. In fact the production of butter is the leading industry of this state. You have heard of the vast iron deposits of northern Minnesota, and they are great; we are proud of them. St. Louis County alone contains more iron ore than is contained in the entire valley of the Ruhr in Europe, for the possession of which many great wars of history have been fought.

Last year we removed 38,000,000 tons of iron ore from those mines. Since that ore was first discovered we have removed from the ground 900,000,000 tons of iron ore, and we still have 1,300,000,000 tons left up there (if our mining engineers know what they are talking about), of high grade iron ore, to say nothing of the 30,000,000,000 tons of lower grade ores that we are going to use after the high grade ores have been utilized.

But, great as this iron mining industry is, our dairy industry is yielding much greater returns to this commonwealth. In a recent year the dairy industry of Minnesota returned as much wealth to its people in twelve weeks as that great iron mining industry did in twelve months. Recently the dairy industry of Minnesota returned to the people of the State as much wealth in sixteen months as all of the iron mines in the United States returned in twelve months.

I might describe the magnitude of this industry in another way. Suppose tonight that bank robbers were to make a concerted assault upon the state of Minnesota; they would break into every one of the 892 state banks, trust companies and savings banks under state supervision, and would run away with a sum of money equal to the combined capital, surplus and undivided profits of those 892 financial institutions—more than \$45,000,000. It would be a terrible calamity. It would rock the State. I would be besieged by a request to call out the militia of the State to meet the emergency, and somebody might suggest to me the propriety of calling the legislature into extraordinary session.

But, my friends, thinking about it more carefully, I should do neither, because instead I should call upon the dairy farmers of the state of Minnesota. I would ask them to milk their cows for fourteen weeks, deposit the proceeds of the sale of their milk in those 892 banks, because if they would do so, they would restore every dollar of the capital stock, surplus and undivided profits of all of our state financial institutions. That expresses the magnitude of this industry in the state of Minnesota, the continued welfare of which is so dependent upon the work of members of the profession which you represent. (Applause)

I am glad to welcome you here in behalf of this commonwealth, and on behalf of its 2,600,000 men, women and children. We want you to be successful in your proceedings here. We want you to be able to discover and to disseminate new knowledge affecting your profession. We want you to do and to say those

things which will make the public understand more fully than it has in the past its dependence upon your activities.

Men, we not only want you to have a profitable time here but a good time in the state of Minnesota, so that when you go home to your respective states you may continue to have in your hearts fond recollections of some of our people, and a desire to return with us some time when you can sojourn a little longer. (Applause)

PRESIDENT HILTY: Mr. Governor, in behalf of this Association I personally want to thank you for this splendid welcome you have given us.

The next speaker represents the Mayor of Minneapolis, who can not be with us this morning. I take pleasure at this time in introducing to you Mr. Truman Pearson, International President of the Mississippi River Scenic Highway System. (Applause)

MR. PEARSON: Mr. President, Governor Christianson, Ladies and Gentlemen of this magnificent profession: More and more your profession is appreciated, despite your sixty-five years of organization life. All of us, I think, are more or less familiar with the picture that hangs on the walls of a good many homes and offices in America, the picture of the family physician at the critical hour in the illness of a child. To me that is a wonderful thing. As a lover of animals and animal life, I think of your profession as one of the greatest things that God Almighty has given us to go along with the animal life which He in His wisdom gave us, animals for food, animals for clothing, and animals for pets.

The great strides of your profession in recent years are marked, in my judgment, by the great progress of the so-called small-animal life protection, preservation, and I suppose the word repair would be in order.

Here in the Twin Cities we love our veterinarians. We love our veterinarian in the same way that we love the medical man who attends our children. I will tell you, ladies and gentlemen, that is a pretty fine thing in life.

I am not an orator; I am not even a professional speaker. I did not know until nine-thirty that I was to meet with your body. Our Mayor, unfortunately for him and for you, is up on one of these 11,000 lakes, and evidently is mired as a result of the storm. I didn't know just exactly what I should talk to you about when the message came a few minutes ago, but I thought that it is always safe to talk about the weather. I just want to make one little remark about the weather for the benefit of you people

from California and possibly New York. This is most *unusual* weather. (Laughter) You don't see men like the Governor and myself perspire freely in Minnesota. We keep as cool as cucumbers, as a rule, in the summer, but the last few days, unfortunately for you and for us, as I said, have been very unusual for Minnesota.

Of the 11,000 lakes that the Governor told us about, eleven are in the city limits of Minneapolis. They are not ponds, they are lakes. There is Lake Harriet and Lake Calhoun that some of you may have seen, and I hope all of you will see before you leave our city.

Minneapolis and St. Paul are two young cities, but we submit that they are two magnificent cities, two of the most beautiful cities in this wonderful country of ours. So in representing the Mayor, I bid you welcome. I bid you welcome because we feel you have done us a great honor, as well as afforded yourselves a great privilege, in coming to Minneapolis. May you come early and often every year.

The picture that I would like to paint, if I could paint pictures for your profession, would be a picture of a kindly man, and I guess I will be able to say woman, because I understand that you have several women here today who are veterinarians, which seems quite proper to me. If I could paint that picture it would be of a gentleman of kindly face and strong character, as the man who is doing so much to make life worth living these days in looking after our animal life, and particularly our pets.

As the owner of cats or kittens ever since I was able to know what one was, Persian cats and alley cats and all kinds of dogs, fox terriers, Pekingese and Airedales, I want to tell you I have had some experiences that make my heart very grateful for your profession. I don't know how strongly I can put it, but you people are certainly doing much to make our lives happy and worth while, because of this great sentimental side of your wonderful profession. I want you to think more and more in terms of that sentimental side, because it is so strong, it is so near to the hearts of mankind, it is so great for the worthwhile life that we are living, that it must never be minimized.

I cannot speak too strongly as a layman of what we laymen think of your honorable and great profession. May God's blessings be on you throughout the days of your lives. May your profession always advance with the rapidity with which it has been advancing for the last twenty-five years.

I think today of the first veterinarian I ever knew, Dr. Loblein, of New Brunswick, New Jersey, who, I am sure, went to heaven. But that man, when he was on this earth, in his locality had the love and the esteem of every man, woman and child because of the magnificent work that he as a veterinarian did for humanity.

I thank you. (Applause)

PRESIDENT HILTY: We are asking Dr. George H. Hart, of Davis, California, one of our own number, to respond to these two splendid welcoming addresses.

I take pleasure in introducing to this audience Dr. George H. Hart, of California. (Applause)

DR. HART: President Hilty, Governor Christianson and Mr. Pearson, Fellow Members of the American Veterinary Medical Association and the Ladies' Auxiliary: I am sure that I speak the feeling of every member of this Association when I say how grateful we are for these very warm addresses of welcome.

It is particularly gratifying to this organization when very distinguished men of affairs are able to come before us and give us addresses of welcome, and show by those addresses that they recognize some of the work that this Association is trying to carry on for the welfare of human society in this and other countries.

The American Veterinary Medical Association meets in widely scattered parts of this country and Canada every year. We have several reasons for doing that. It is of advantage to the members of the Association who regularly attend, both educationally and recreationally, to see the various parts of their native country. It gives opportunity for local veterinarians who are not very active in the Association and are unable to leave their places of business to travel far away to points where the Association meets, once in a while to attend the meetings of this Association in their own communities. But most of all, from the standpoint of importance, is the fact that we believe through traveling around the country from place to place the publicity that is connected with our annual meetings, and particularly such publicity as the address of Governor Christianson will receive today, brings to the public some idea of the importance of the veterinary profession.

The rapidly changing conditions of the last twenty-five years have caused a very large percentage of the public to believe that the field of the veterinarian is a constantly narrowing one. This has brought us into a somewhat serious situation, not so serious

for us, however, as it is for the immense wealth that is invested in the live stock industry of this country and the welfare of the body politic in general, if this condition continues to exist. We believe that it is important for this information to get out to the public.

The American Veterinary Medical Association is the mother organization of all veterinary activities in this country. We are comparatively a small body of people compared with the conventions that have already been held in this city this year. We are a very small body in numbers. It is very important, on the other hand, that this small body of men be recognized as holding places of importance in the welfare of society in this country. These sub-organizations, many of which are active in this country, all turn to this mother organization when problems of national importance come before them, because they know that from this group they will receive wise counsel and real help.

I might mention the Army Corps veterinarians who served so well during the late war. Through the efforts of this Association they were given a rank that was so essential for the accomplishment of their work in an organization like that of the United States Army. This war was a great triumph from the medical standpoint because for the first time in history there were more men incapacitated by battle than were incapacitated by disease. The Veterinary Corps, contrary to general opinion, deserves some credit for this work, because as a part of the larger unit, the Medical Corps, a considerable part of the time of our Army veterinary officers was devoted to the inspection and control of the sanitation and soundness of the food supply of the soldiers.

We have the Association of Bureau of Animal Industry Veterinarians, numbering about 1300 men. This is a comparatively small group of men when we consider organizations in this country, but it is a group, the effects of which are felt in every community in this land.

We are carrying on work that is affecting the welfare of human organizations throughout this country. I would speak of the United States Live Stock Sanitary Association, an association of state and federal officials who are carrying on the large projects in the control of disease in live stock at the present time, among which we should mention this very large work of tuberculosis eradication and Texas fever eradication.

I would speak of one of our smallest organizations, the Experiment Station and Government Research Workers in Animal

Disease. This is a very small body of workers, but a body of workers that has added greatly to the welfare of human happiness. If we consider the measure of public service, the important thing from which to judge accomplishment, then this group of men has certainly deserved high rank in the organizations in this country.

Lastly I would like to speak of the group of practitioners, the largest group of all. Governor Christianson has told of the importance of the dairy industry in this state. It is one of this group in a foreign land who has made one of the greatest contributions to the welfare of the dairy industry in the entire world. I speak of the discovery of Dr. Schmidt, of Kolding, Denmark, of the air treatment for milk fever. This has made possible the advancement of the dairy industry which has taken place in the last twenty-five years. Wherever the names of men who have added greatly to the welfare of this great industry are mentioned, Dr. Schmidt's name is always mentioned among the first ten.

I feel that I would be remiss, coming particularly from California, which has had one or two cracks taken at it this morning, if I did not mention the fact that we were quite impressed with the mildness with which the local business houses of this area advanced the advantages and recreational value of this area as a meeting place. We have some man-made advantages in places where the Creator probably never intended any to exist, but we have never taken any prizes for the modesty with which we have presented our claims. (Laughter)

I want to say that I am connected with a large educational organization, and I think a great deal in terms of entrance requirements. I want to tell Governor Christianson that he is ready to be admitted to the California Boosters' organization without examination (laughter), when he can increase the published number of lakes from 10,000 to 11,000 in a speech on a public platform in his own community.

I am sure we greatly appreciate the addresses of welcome you have given us. I feel this is going to be a very auspicious meeting for the A. V. M. A. The program is a very varied one. Every man, no matter what his interest, will find something to stimulate him in this very varied program that we are going to have during the next few days.

I am sure that these addresses of welcome have done their part and a large part in giving the meeting an auspicious opening.

I thank you very kindly. (Applause)

PRESIDENT HILTY: Now we have arrived at the time for the principal infliction of this meeting. (Laughter)

. . . President Hilty read his address. . . . (Applause) (Published in the JOURNAL, September, 1928.)

PRESIDENT HILTY: The next thing on the program is the presentation and adoption of the minutes of the 1927 meeting.

SECRETARY HOSKINS: Mr. President and Members: The proceedings of the 1927 meeting, held in Philadelphia, were published in the JOURNAL, November, 1927. I offer them to you in that form in lieu of reading them at this time.

DR. R. S. MACKELLAR: I move that the minutes as printed in the JOURNAL be adopted.

. . . The motion was regularly seconded, put to a vote and carried.

PRESIDENT HILTY: That ends the program for this forenoon.

. . . The meeting adjourned at 11:50 a. m. . . .

ADJOURNMENT

TUESDAY AFTERNOON, August 7, 1928

The second general session was called to order at 2:30 p. m., by President Hilty.

DR. T. E. MUNCE: The President's address this morning, a very able one, contained several very constructive recommendations. I would move that his address be referred to the Executive Board, in order that the suggestions or recommendations may receive due consideration.

DR. C. A. CARY: I second the motion.

PRESIDENT HILTY: It has been duly moved and seconded that the President's address be referred to the Executive Board. Are there any remarks?

. . . The question was called for, put to a vote and carried.

PRESIDENT HILTY: The first on the program for the afternoon is the report of the Executive Board.

Report of Executive Board

SECRETARY HOSKINS: The Executive Board has had one meeting here in Minneapolis, and there are half a dozen matters to be reported to the Association.

SALMON MEMORIAL FUND

The Board approved the details of the plan for administering the Salmon Memorial Fund. The Board had left the details to

be worked out by the Treasurer and Secretary. Those plans were reported to the Board and approved.

At the meeting yesterday the nominations of candidates for the first award were presented, and after very carefully studying and giving due consideration to the merits of the nominees from the different veterinary colleges, a vote was taken, and the result was that the award for the first time goes to Mr. Erle R. Carter, a junior veterinary student of Iowa State College. Approximately \$6,000 has been invested by Treasurer Jacob, to yield about \$300 a year. This does not represent the entire amount of the Fund. There is a little left over, in the form of cash on deposit.

This action means that Mr. Carter will receive, during his junior and senior years, a total amount of \$600. The present plan is for paying that amount in four installments of \$150 each. I do not believe that this action needs any approval by the Association, but the Board thought you would be interested in knowing that, after the lapse of a number of years, the Salmon Memorial Fund is now actually at work.

RESIGNATIONS

The resignations of the following members have been tendered. They are all in good standing, so that their resignations may be accepted, and the Executive Board so recommends:

Creech, G. T., Washington, D. C. (Effective Jan. 1, 1929.)
 Elliott, H. B., Hilo, Hawaii.
 Feazell, Geo. F., Bridgewater, Iowa.
 Farley, A. J., Los Angeles, Calif.
 Gjertson, Albert G., Omaha, Nebr. (Effective Jan. 1, 1929.)
 Hudgins, Patrick H., Fredericksburg, Va.
 Irons, George T., Los Angeles, Calif.
 Kitchen, C. C., Fremont, Ohio.
 Krenek, Emil, Deming, N. Mex.
 Piché, M. A., Montreal, Que.
 Richards, T. H., Niagara Falls, Ont.
 Rodibaugh, S. L., Cedar Rapids, Iowa.
 Younghusband, A. W., Hull, Que.
 Ziekendrath, E. C., Palo Alto, Calif.

I might add that this is the shortest list of resignations we have had for quite some time.

PRESIDENT HILTY: What shall be done with this report?

DR. CARY: Mr. Chairman, I move the resignations be accepted.

DR. W. L. BOYD: I second the motion.

The question was called for, put to a vote and carried.

EXPULSION OF MEMBER

SECRETARY HOSKINS: Our attention has been drawn to the fact that Dr. R. S. Christman, of Marysville, California, is now serving time in the California State Prison at San Quentin, California. I understand that he has been mixed up in some crooked tuberculin-testing and for other things, and he is now incarcerated at the point mentioned.

The Executive Board recommends that Dr. Christman be expelled from the Association.

PRESIDENT HILTY: What shall be done with this report?

DR. H. E. ASH: I move that this member be expelled from membership in this Association.

The motion was regularly seconded, put to a vote and carried.

RELIEF FUND

SECRETARY HOSKINS: The next item concerns the Relief Fund, created during the war. What has remained in the Fund since the war has been kept intact. Treasurer Jacob has directed attention to the fact that there appears to be no particular need for keeping that fund separate any longer, and suggested to the Executive Board that the amount now in the Relief Fund be transferred to the General Fund of the Association.

The Executive Board favored Dr. Jacob's suggestion and so recommends to the Association.

PRESIDENT HILTY: What shall be done with this recommendation?

DR. A. T. KINSLEY: I move the recommendation be approved.

The motion was regularly seconded, put to a vote and carried.

BOND COVERING BANK DEPOSITS

SECRETARY HOSKINS: Treasurer Jacob also brought to the attention of the Board the facts relating to the question of our bank in Knoxville, Tennessee, furnishing a bond covering our deposits in that bank. That question, as some of you know, has been up several times. The question has arisen as to whether or not we are sufficiently protected.

After very careful consideration, and learning from Dr. Jacob that it would be necessary for the Association to bear the cost of the necessary bond, which would be approximately \$100 per year, the Board decided that it would be good business to do so, and so recommends to the Association.

PRESIDENT HILTY: What is your pleasure?

DR. KINSLEY: I move the recommendation be approved.

. . . The motion was regularly seconded. . . .

PRESIDENT HILTY: Are there any remarks?

DR. CARY: I would like to know if the deposits in the bank draw any kind of interest.

SECRETARY HOSKINS: Dr. Jacob has two accounts in the bank, one a checking account, and the other a time deposit, which is working all the time.

. . . The question was called for, put to a vote and carried. . . .

EXPULSION OF MEMBER

SECRETARY HOSKINS: Charges have been preferred against Dr. E. N. Brown, of Nashville, Tennessee, on the ground of conduct unbecoming a veterinarian. Dr. Brown was notified to appear before the Board but refused to do so. The charges underlying this case originated in the Tennessee State Veterinary Medical Association, and were the basis for Dr. Brown's expulsion from the Tennessee Association.

The Executive Board recommends that Dr. Brown be expelled from the A. V. M. A.

PRESIDENT HILTY: What is the pleasure of this Association regarding this recommendation?

DR. CARY: I move that the recommendation of the Executive Board be approved.

. . . The motion was regularly seconded. . . .

PRESIDENT HILTY: Are there any remarks?

DR. J. L. AXBY: Mr. President, it appears to me that probably there are not a dozen men in the hall who know any of the details of what they are voting on. Possibly it is all right, and we should vote upon the recommendation.

DR. CARY: If I understand correctly, the Executive Board has gone into this and found sufficient grounds for the recommendation. I do not think it would be advisable to take up the facts in detail before this organization, or house as a whole, unless there is demand made on the part of the man who has these charges made against him. The Executive Board wanted him to appear before it; he failed to appear. Therefore, all that is left is to remove him, and I therefore call for the question.

. . . The question was put to a vote and carried. . . .

AMENDMENTS

SECRETARY HOSKINS: The next action relates to the proposed revision of the Constitution and By-Laws, and the Executive Board recommends that the Constitution and By-Laws be amended as follows.

DR. CARY: Mr. Chairman, before reading any of these amendments or passing upon them, I want to make a motion that all amendments recommended by the Executive Board and passed upon by this organization go into effect at the close of this meeting.

. . . The motion was regularly seconded. . . .

PRESIDENT HILTY: It has been moved and seconded that any of these amendments that are passed shall go into effect at the close of this annual meeting. Are there any remarks?

DR. CARY: Mr. Chairman, I just wish to make this statement in regard to it: The object is to avoid any conflict that may arise in the officers trying to enforce this for the rest of this session. It might be difficult to put them into action on account of the abrupt changes. It will give everybody an opportunity to get acquainted with the details. That is the reason I make this motion.

. . . The question was called for, put to a vote and carried. . . .

. . . Secretary Hoskins read the proposed changes to Articles I and II

CONSTITUTION

Article I

Section 1. No change.

Article II. Purpose

Section 1. The purpose of this Association shall be:

- (a) No change.
- (b) No change.
- (c) To procure uniform laws and regulations governing veterinary practice and the control of diseases of animals, including poultry.
- (d) To direct public opinion regarding problems of animal hygiene, including poultry.
- (e) No change.

DR. CARY: I move the amendments be approved as read.

DR. T. A. SIGLER: I second the motion.

PRESIDENT HILTY: It has been moved and seconded that we approve the changes in Article II as read. Are there any remarks?

. . . The question was called for, put to a vote and carried. . . .

Secretary Hoskins read the proposed changes to Article III.

Article III—Members

Section 1. No change.

Active Members

Section 2. Active members shall be graduates of such veterinary schools as may be approved by the Association; and shall be elected to membership in the manner provided in the By-Laws. (Article 2, Section 1.)

Honorary Members

Section 3. Honorary membership may be conferred upon any citizen of the world who shall have rendered eminent and distinguished service of great value to veterinary science. Election to honorary membership shall be made as provided in the By-Laws. Honorary members shall have all the privileges of active members, except that they shall not hold office, vote or have any right or title to, or interest in, any real or personal property of the Association. (See By-Laws, Article 16, Section 1 and Article 5, Section 2.)

Junior Members

Section 4. A regularly enrolled veterinary student in a college recognized by the American Veterinary Medical Association may become a junior member through membership in the student chapter of the A. V. M. A. organized at the college he is attending, under rules and regulations prescribed by the Executive Board.

DR. C. P. FITCH: I move the amendments be adopted as read.

The motion was seconded, put to a vote and carried.

Secretary Hoskins read the proposed changes to Article IV.

Article IV—Meetings

Section 1. Meetings of the Association shall be regular and special. The regular meeting shall be held annually. It shall be convened not earlier than July 15th, nor later than the 31st of December of each year, unless otherwise ordered by a two-thirds vote of the members of the Association.

Section 2. The time, place and duration of the next regular meeting shall be fixed by the Executive Board, at the first meeting of the Board following the annual meeting of the Association, unless otherwise ordered by the Association.

Section 3. Special meetings may be called by the President, upon request in writing of not less than 200 active members. The time, place and purpose of a special meeting shall be designated in the call.

DR. W. H. IVENS: I move the amendments be adopted as read.

The motion was seconded, put to a vote and carried.

Secretary Hoskins read the proposed changes to Sections 1 to 6 of Article V.

Article V—Officers

Section 1. The officers of the Association shall consist of a president, five vice-presidents, a secretary, a treasurer and an executive board. With

AMENDMENTS

SECRETARY HOSKINS: The next action relates to the proposed revision of the Constitution and By-Laws, and the Executive Board recommends that the Constitution and By-Laws be amended as follows.

DR. CARY: Mr. Chairman, before reading any of these amendments or passing upon them, I want to make a motion that all amendments recommended by the Executive Board and passed upon by this organization go into effect at the close of this meeting.

. . . The motion was regularly seconded. . . .

PRESIDENT HILTY: It has been moved and seconded that any of these amendments that are passed shall go into effect at the close of this annual meeting. Are there any remarks?

DR. CARY: Mr. Chairman, I just wish to make this statement in regard to it: The object is to avoid any conflict that may arise in the officers trying to enforce this for the rest of this session. It might be difficult to put them into action on account of the abrupt changes. It will give everybody an opportunity to get acquainted with the details. That is the reason I make this motion.

. . . The question was called for, put to a vote and carried. . . .

. . . Secretary Hoskins read the proposed changes to Articles I and II

CONSTITUTION

Article I

Section 1. No change.

Article II. Purpose

Section 1. The purpose of this Association shall be:

- (a) No change.
- (b) No change.
- (c) To procure uniform laws and regulations governing veterinary practice and the control of diseases of animals, including poultry.
- (d) To direct public opinion regarding problems of animal hygiene, including poultry.
- (e) No change.

DR. CARY: I move the amendments be approved as read.

DR. T. A. SIGLER: I second the motion.

PRESIDENT HILTY: It has been moved and seconded that we approve the changes in Article II as read. Are there any remarks?

. . . The question was called for, put to a vote and carried. . . .

Secretary Hoskins read the proposed changes to Article III.

Article III—Members

Section 1. No change.

Active Members

Section 2. Active members shall be graduates of such veterinary schools as may be approved by the Association; and shall be elected to membership in the manner provided in the By-Laws. (Article 2, Section 1.)

Honorary Members

Section 3. Honorary membership may be conferred upon any citizen of the world who shall have rendered eminent and distinguished service of great value to veterinary science. Election to honorary membership shall be made as provided in the By-Laws. Honorary members shall have all the privileges of active members, except that they shall not hold office, vote or have any right or title to, or interest in, any real or personal property of the Association. (See By-Laws, Article 16, Section 1 and Article 5, Section 2.)

Junior Members

Section 4. A regularly enrolled veterinary student in a college recognized by the American Veterinary Medical Association may become a junior member through membership in the student chapter of the A. V. M. A. organized at the college he is attending, under rules and regulations prescribed by the Executive Board.

DR. C. P. FITCH: I move the amendments be adopted as read.

The motion was seconded, put to a vote and carried.

Secretary Hoskins read the proposed changes to Article IV.

Article IV—Meetings

Section 1. Meetings of the Association shall be regular and special. The regular meeting shall be held annually. It shall be convened not earlier than July 15th, nor later than the 31st of December of each year, unless otherwise ordered by a two-thirds vote of the members of the Association.

Section 2. The time, place and duration of the next regular meeting shall be fixed by the Executive Board, at the first meeting of the Board following the annual meeting of the Association, unless otherwise ordered by the Association.

Section 3. Special meetings may be called by the President, upon request in writing of not less than 200 active members. The time, place and purpose of a special meeting shall be designated in the call.

DR. W. H. IVENS: I move the amendments be adopted as read.

The motion was seconded, put to a vote and carried.

Secretary Hoskins read the proposed changes to Sections 1 to 6 of Article V.

Article V—Officers

Section 1. The officers of the Association shall consist of a president, five vice-presidents, a secretary, a treasurer and an executive board. With

the exception of the Secretary and district members of the Executive Board, they shall be elected at the regular annual meeting. No person shall be eligible to the office of president, secretary or treasurer unless he has been a member in good standing for the five years preceding his election. No person shall be eligible to any other elective office until after he shall have been a member in good standing for at least one year immediately preceding the election.

President

Section 2. The President shall preside at all meetings of the Association and shall deliver an address at the regular annual meeting. He shall appoint all committees and shall be ex-officio a member of each standing committee. He shall appoint those officers whose appointments are not otherwise provided for and perform such duties as properly devolve upon a president. No president shall be eligible for re-election to that office.

Vice-President

Section 3. In case of death or resignation of the President, or in case of his inability to perform the duties of his office from any cause, the duties shall devolve upon the vice-president in seniority for the remainder of the unexpired term, or until the disability of the President shall have been removed.

The First Vice-President shall be ex officio a member of the Budget Committee.

Secretary

Section 4. The Secretary shall perform the clerical duties of the Association, including the clerical work of the Executive Board. He shall give bond to the Association in such amount as may be prescribed by the Executive Board. He shall present a written report of the activities of his office, at each regular meeting of the Association and at such other times as may be directed by the Executive Board.

The Secretary may also act as Editor or Business Manager of the JOURNAL or both.

Treasurer

Section 5. The Treasurer shall be elected by ballot at the regular annual meeting, and shall assume the duties of said office on the first day of January next succeeding his election, and shall continue in office for one year. He shall account to the Association for all moneys received. He shall give bond to the Association in such amount as may be prescribed by the Executive Board, from year to year. At the expiration of this term of office he shall account for and turn over to his successor in office all money, vouchers, and account books belonging to the Association.

The Treasurer shall pay out moneys only on vouchers countersigned by the President and Secretary, or President and Editor, excepting minor expenses of the Secretary, and such revolving fund allowances as may be placed at the disposal of the Editor and Business Manager of the JOURNAL by the Budget Committee.

The Treasurer shall at the expiration of each fiscal year make a detailed statement, accompanied by vouchers, covering all receipts and expenditures, to the Executive Board and a report shall be published in the official JOURNAL.

Properties

Section 6. All officers, at the expiration of their terms of office, shall turn over all property of the Association to their successors.

DR. CARY: I move the adoption of the proposed amendments as read.

DR. BOYD: I second the motion.

PRESIDENT HILTY: It has been duly moved and seconded to adopt the changes in Article V, the first six sections. Are there any remarks?

The question was called for, put to a vote and carried.

Secretary Hoskins read Article V, Section 7.

Executive Board

Section 7. A—There shall be an executive board consisting of one member-at-large and one member from each Executive Board district that shall be created as hereinafter provided. (By-Laws, Article 10.)

B—The members of the Executive Board so constituted shall hold office for five (5) years and shall elect a chairman of the Board annually.

C—No change.

D—A majority of the members shall constitute a quorum for the transaction of business.

E—The Executive Board shall pass upon the eligibility of any applicants for membership whose applications are referred to the Board for consideration, as provided in Section 1 of Article 2 of the By-Laws.

F—All matters pertaining to the administrative affairs of the Association shall be referred to the Executive Board for deliberation. The Board shall report the results of its deliberations promptly to the Association.

G—On written request of at least one hundred members of the Association, through the Secretary, the Executive Board shall submit any question to the active membership for decision by mail ballot. All ballots returned to the Secretary shall be signed by the members voting and said ballots shall be retained by the Secretary for at least two years after they have been counted. All mail ballots on specific questions, nominations and elections shall be of the same date and issue. Ballots not signed, and ballots not returned within sixty days after date of issue, shall not be counted.

H—The Secretary of the Association shall be Secretary of the Executive Board and shall keep proper records of all meetings of the Board.

I—No change.

J—Itemized accounts of all disbursements, with the purpose thereof, and records of votes shall be filed in the Secretary's office.

K—No change.

L—No change.

M—No change.

N—Delete: "At the next annual meeting of the Association" (lines 7-8-9) and "at once" (line 13).

O—The Executive Board shall be empowered to expel from the Association any member who has been convicted of a crime in a court of competent jurisdiction. It shall be the duty of the Board to secure a certified copy of the record of such conviction before expelling such member.

DR. MUNCE: I would like to suggest that in line 3 we strike out the word "competent" and insert in lieu thereof the word "final." The Executive Board might expel a member. The case might be appealed and the lower court be reversed, which would place the Association in rather an embarrassing position.

DR. L. A. MERILLAT: I move we eliminate the word "crime" and substitute "felony." I would not like to be ousted for speeding in an automobile. The word "crime" is a pretty broad term.

DR. CARY: I second Dr. Munce's amendment.

PRESIDENT HILTY: It has been moved and seconded that in line 3 the word "final" be substituted for "competent."

. . . The question was called for, put to a vote and carried.

DR. MERILLAT: I move the word "felony" be substituted for the word "crime."

. . . The motion was regularly seconded.

PRESIDENT HILTY: It has been moved and seconded that the word "felony" be substituted for the word "crime" in the second line. Are there any remarks?

DR. C. D. MCGILVRAY: For the benefit of one who does not understand the phraseology, will you explain what felony would cover?

PRESIDENT HILTY: Is Dr. Moore, of North Carolina, in the room? Dr. Moore is a lawyer. We will have him explain.

DR. WILLIAM MOORE: Felony is defined as a crime that is punishable by confinement in the penitentiary.

PRESIDENT HILTY: Are there any further remarks?

. . . The question was called for, put to a vote and carried.

. . . Secretary Hoskins read Sections 8, 9 and 10, of Article V.

Executive Board Districts

Section 8. Delete: "six" (line 1). Any district may be divided and new districts created, upon recommendation from the Executive Board, by a majority vote at any regular meeting of the Association.

Vacancies and Removals

Section 9. The President shall fill any vacancy in the Executive Board from the district in which such vacancy occurs, and said appointee shall hold office until a special election of the district may be held.

If a member of the Executive Board removes from his district, such removal shall automatically cause a vacancy.

A vacancy in the office of treasurer shall be filled by appointment for the unexpired term, by the President, with the consent and approval of the Executive Board.

In the event of the absence of a member of the Executive Board at a regular or special meeting, the President may appoint a member to fill such a vacancy, the temporary appointee, in each case, to be from the same district as the absentee.

The Executive Board may for dishonesty or incompetence, remove the Secretary or Treasurer from office upon approval of the President.

Executive Board Meetings

Section 10. The Executive Board shall hold its annual meeting at the time and place of the annual meeting of the Association. Special meetings of the Board may be called by the Secretary upon written request of four members of the Board.

SECRETARY HOSKINS: Through somebody's oversight, Article VI was accidentally left out of the reprint. There is no recommendation to change it, but it should go in right at this point. That concludes the recommendations for amending the Constitution.

DR. CARY: Mr. Chairman, I move we approve the recommendations as read.

. . . The motion was regularly seconded. . . .

PRESIDENT HILTY: Are there any remarks?

DR. KINSLEY: Mr. Chairman, on page 229, under "Vacancies and Removals," why wouldn't it be advisable to put the paragraph of "Vacancy in the Office of Treasurer" and so forth under "Treasurer"? Why stick it over here?

SECRETARY HOSKINS: There are quite a number of places throughout this instrument where there is a question as to whether a certain paragraph or sentence ought to be there or some place else, as in this particular case. This pertains to a vacancy. I agree with you that it pertains also to the Treasurer. I believe if there were a vacancy in the office of Treasurer, the natural inclination would be to run down until you came to the paragraph headed "Vacancies" rather than to look for it under "Treasurer." That would be my personal opinion.

. . . The question was called for. . . .

PRESIDENT HILTY: The question is that we shall adopt these recommendations as read.

. . . The motion was put to a vote and carried. . . .

. . . Secretary Hoskins read Articles 1, 2, 3, 4 and 5 of the By-Laws. . . .

BY-LAWS

Article I—Order of Business

Section 1. The following shall be the order of business, unless otherwise provided:

1. Call to order by the President.
2. President's address.
3. Presentation and adoption of minutes.
4. Report of the Executive Board.
5. Report of the Secretary-Editor.
6. Report of the Treasurer.
7. Nominations for elective officers.
8. Reports of committees.
9. Unfinished business.
10. New business.
11. Installation of officers.

Section 2. No change.

Article 2—Application for Membership

- Section 1. Section 6 will replace this section.
Section 2. No change.
Section 3. No change.
Section 4. No change.
Section 5. No change.
Section 6. This section becomes Section 1.

Article 3—Meetings

Section 1. Notice of the time and place of the regular meeting shall be announced in the JOURNAL at least three months before the date fixed for the meeting.

Section 2. Notice of the time and place of a special or adjourned meeting shall be mailed to each active member at least twenty days before the date fixed for the meeting. No business shall be transacted at a special or adjourned meeting which was not clearly and definitely stated in the call convening such meeting.

Section 3. (It is proposed to delete this section entirely, as it does not seem desirable to prescribe a definite schedule for the program.)

Article 4—Quorum

Section 1. Twenty-five per cent of the members of the Association registered shall constitute a quorum for the transaction of business at any general session.

Article 5—Dues

Section 1. There shall be a membership fee of five dollars (\$5.00). The annual dues of active members, including subscription to the JOURNAL, shall be five dollars (\$5.00), payable in advance on the first day of January. If two or more members are associated in practice and if both, or all, members so associated do not desire to receive the JOURNAL, one member shall pay the full annual dues and receive the JOURNAL, and each associate, not desiring to receive the JOURNAL, may be allowed a credit of \$3.00 per year on his dues, upon written request to the Secretary.

Section 2. Honorary members shall pay no dues. There shall be made annually an appropriation from the Association treasury to pay JOURNAL subscriptions for honorary members.

Section 3. Junior members shall not pay any dues as individual members, but through their student chapters, as prescribed in the rules and regulations governing junior membership, published in the JOURNAL, October, 1926 (pp. 96-98).

SECRETARY HOSKINS: By way of explanation, it appears that we have an increasing number of partnerships. In a great many cases it is father and son, or father and two sons. They are together and occupying the same office. They all want to be members of the Association. We get quite a number of inquiries as to whether or not some arrangement is not possible by which they can all be members but receive only one copy of the JOURNAL.

It is proposed to meet that condition, which I know from experience actually exists, and apparently is on the increase, by making this proposed addition to Section 1, covering dues.

DR. MOORE: Will the same thing apply to state officers?

SECRETARY HOSKINS: No, sir.

DR. MOORE: What is the difference?

SECRETARY HOSKINS: I can not see any analogy.

DR. MOORE: I think there is an analogy, where a man is a state officer and has two assistants. They all want to be members, but why have three copies of the JOURNAL?

SECRETARY HOSKINS: Are you asking for my opinion?

DR. MOORE: Yes.

SECRETARY HOSKINS: I can see the ultimate conclusion of such a proposition. We have some offices where I know there are as high as thirty or forty veterinarians. They might want to read one copy of the JOURNAL. It is going to hurt my circulation. (Laughter)

Another thing is that the men who are associated with you are not permanently associated. They are more or less on the move.

DR. MOORE: A partnership is not permanent.

SECRETARY HOSKINS: It is much more likely to be permanent. You might be interested in knowing how many cases might be affected at the present time. There probably would not be over a dozen, but it is a condition which does exist and comes up quite frequently. I know we would have a few more members if it were possible to put this scheme into operation.

. . . Secretary Hoskins read articles 6 and 7. . . .

Article 6—Delinquency

Section 1. No change.

Article 7—Reinstatement

Section 1. A member who has forfeited his membership for non-payment of dues, may be reinstated upon payment of his entire indebtedness to the Association, or by making application for membership in the manner prescribed in Article 2. Former members who resigned in good standing may be reinstated in the same way.

Delete Section 2.

SECRETARY HOSKINS: We are facing another situation, or have been facing it for several years. With the general improvement in veterinary conditions all over the country, we get a good many letters from veterinarians who dropped out, or were dropped for the non-payment of dues, during the period which extended from the close of the war up until about 1923 or 1924. I dislike to confess how large that number is, but it is quite large.

We are getting a large number of inquiries from these men who want to get back into the Association, and they do not feel like paying up all their past indebtedness, which in some cases will run as high as \$30 or \$35. During that period they have not received the JOURNAL, except for a period of about four or six months.

Article 2—Application for Membership

- Section 1. Section 6 will replace this section.
Section 2. No change.
Section 3. No change.
Section 4. No change.
Section 5. No change.
Section 6. This section becomes Section 1.

Article 3—Meetings

Section 1. Notice of the time and place of the regular meeting shall be announced in the JOURNAL at least three months before the date fixed for the meeting.

Section 2. Notice of the time and place of a special or adjourned meeting shall be mailed to each active member at least twenty days before the date fixed for the meeting. No business shall be transacted at a special or adjourned meeting which was not clearly and definitely stated in the call convening such meeting.

Section 3. (It is proposed to delete this section entirely, as it does not seem desirable to prescribe a definite schedule for the program.)

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Another point which bears on this question is that the records of the Association, so far as membership is concerned, do not go back of 1916. In that year former Secretary Merillat started the present membership ledger system which we still use. It was the first permanent system that we had for keeping track of our members in a convenient way. We have had cases of veterinarians who claimed they had been members sometime in the past, and we could not find any record of them.

We have just exactly the opposite experience. We have had applications come in, brand new applications, from veterinarians who had been members before and who had been dropped. Legally we can not accept such applications. The situation entails a lot of correspondence and explanations. The amendment seems to be the happiest solution of the question. If a member has been dropped and he wants to get back in again, just have one way for him to do it, and that is join all over again.

Secretary Hoskins read Article 8.

Article 8—Nominations

Section 1. No change.

Section 2. Nominations for the offices of president, five vice-presidents, treasurer and member-at-large of the Executive Board for the ensuing year shall be made at the afternoon session of the first day of the meeting.

DR. E. E. WEGNER: I wonder what the reason was for putting in Section 2. It seems to me it would be desirable to give the members a few hours, or a day or so, after they reach here, to decide upon the men they would like to nominate for the important offices of the Association. If this passes, the men coming in in the morning would not have much time to confer with their colleagues as to the nominees they would like to put up. I would like to know the reason for hastening the nominations.

It seems to me it would be better to leave it as it is, or change this and give them until the afternoon of the second day to decide on officers, and make the nominations the third day.

SECRETARY HOSKINS: The reason is this, Dr. Wegner: You have to get the nominations made so that the machinery can be put in motion for holding the election. Article 9, which is next to follow, explains the new method for holding the election.

DR. WEGNER: That is on the third day. You still have the fourth day in order to hold the election.

SECRETARY HOSKINS: The fourth day is the clinic.

DR. CARY: I move we adopt the first seven articles of the By-Laws as read.

DR. MOORE: Mr. President, I would like to substitute for Dr. Cary's motion that we adopt all of this except the partnership item. I don't think we ought to adopt that. I think it is going to bring up the same question I raised with Dr. Hoskins. I don't think we ought to adopt it. I don't think anybody is going to stay out on account of that section.

I would like to substitute for Dr. Cary's motion that we approve all of those except that new section.

DR. N. F. WILLIAMS: I will second Dr. Moore's amendment to Dr. Cary's motion.

PRESIDENT HILTY: The question is on the amendment that we adopt all the changes read, up to Article 8, with the exception of Section 1 of Article 5, which refers to the JOURNAL and partnerships. Are there any remarks on the amendment?

The question was called for, put to a vote and carried.

PRESIDENT HILTY: The question is on Dr. Cary's motion (as amended), that we adopt the changes in the By-Laws, up to Article 8. Are there any remarks on the motion?

The question was called for, put to a vote and carried.

Secretary Hoskins read Article 9.

Article 9—Election of Officers

Section 1. The polls shall be opened in the Secretary's office at 9:00 a. m. the morning of the second day of the meeting, and each member in good standing and in attendance at the meeting shall cast his ballot, indicating his choice of the nominees for the respective offices. The ballots of each member shall be deposited in a locked and sealed ballot-box, to be opened as hereinafter provided. The hours for voting, as well as rules and regulations governing the polls, etc., shall be announced by the Secretary, to conform with the convenience and general operation of his office during the meeting. The polls shall close at 6:00 p. m. the second day of the meeting. The President shall appoint an election committee, who shall count the ballots, in the presence of the members of the Executive Board and the respective candidates for office, should they desire to be present. The result of the election shall be announced at the next general session of the meeting.

DR. CARY: Mr. Chairman, I understand we have not disposed of Articles 8 and 9.

PRESIDENT HILTY: That is right.

DR. CARY: I move that we adopt the amendments as read to Articles 8 and 9.

DR. D. S. WHITE: I second the motion.

PRESIDENT HILTY: The motion is that we adopt the changes to Articles 8 and 9 as read. Are there any remarks?

The question was called for, put to a vote and carried.

DR. KINSLEY: Mr. President, I have no motive in this except a sort of curiosity. I wonder if we should not have the President and Treasurer watch the counting of the ballots. Why have the Executive Board there? Certainly our President will appoint tellers who are sufficiently honest to take care of this. It seems to me that we are burdening our Executive Board in requiring them to be there all during the counting of these ballots. In fact, all of this takes away quite a thrill that some members have in our elections. I am just bringing up the question.

SECRETARY HOSKINS: Dr. Kinsley, I think if you will read the section you will see that it is optional with the members of the Board. They can be there if they want to.

DR. KINSLEY: I think you ought to keep them out.

DR. MERILLAT: In some way I got the impression that this election committee should supervise the ballot-boxes. It provides for the committee to count the votes. There is no provision there whatsoever for the supervision of the ballot-box during the voting, which I believe is an omission.

DR. H. M. HAMILTON: I would like to offer an amendment or an addition to Section 1. As it reads now, Section 1 specifies nominations for the afternoon session. I would like to make it read that nominations can be made at any time during any session, up until the time of the regular election. I would like to make that as an amendment to Section 1.

SECRETARY HOSKINS: Do you thoroughly understand Section 1, Dr. Hamilton? You will notice it says that the machinery for holding this election will be set in motion the morning of the second day. That would be tomorrow morning if this were in operation now. This session this afternoon is the only session preceding the starting of the election, except our opening session this morning.

DR. HAMILTON: As I understand Section 1, we could not make any nominations after this afternoon, before the election.

SECRETARY HOSKINS: There would not be any opportunity.

PRESIDENT HILTY: The election machinery would start to work tomorrow morning.

DR. HAMILTON: No member could be nominated before the election?

SECRETARY HOSKINS: The election would be in progress tomorrow morning at nine o'clock. That is when it would start.

PRESIDENT HILTY: Are there any further remarks?

DR. KINSLEY: I would like to ask Dr. Hoskins to read that portion pertaining to the Executive Committee. Perhaps I do not understand English.

Secretary Hoskins re-read Section 1.

DR. KINSLEY: Who is referred to by, "Should they desire to be present?"

SECRETARY HOSKINS: The candidates and members of the Executive Board. If you want to leave out the members of the Executive Board, put a comma after "Board."

DR. HAMILTON: I am still unconvinced. I would like to add to that, if my motion or amendment is not out of order, that any member whose name is placed on the ballot be accepted as a nominee, whether nominated in the previous session or not.

I am like the gentleman who spoke a few minutes ago, I don't believe in railroading. This looks to me like a railroading proposition. I cannot see where the members of this organization have a fair and square show to nominate the members they would like to have nominated for the most important offices of this organization. A great many are only arriving this afternoon, and there are men here who might want to make nominations for officers of this organization and would not have the opportunity to make the nominations this afternoon. That is my viewpoint.

DR. CARY: Mr. Chairman, it seems to me that everybody has an opportunity when the question of candidates for office is in order. Any and every member has an opportunity to nominate his candidate just as we have it now. As we do now, we make a motion to stop the nominations. After that a man cannot make nominations. It does not stop you from putting up twelve or fifteen men as now. I do not see any advantage in keeping, what you might call, the nominating time unlimited. It will just lead to a lot of trouble. If you add candidates after the close of the nominations, it would not be good. There is no organization, political or otherwise, that does not have a definite time to stop the process of nominating candidates. That is required in all organizations. I do not see anything in that. This is just as fair as it was before. I look at it in just this way: Supposing we are going to nominate candidates for the presidency this evening. The President announces, "Now is the time," and it is open to anyone in the house to nominate.

You proceed to nominate in the regular order. The house itself can stop that nominating or go on all night, if they so desire. There is nothing to stop them, unless the organization stops it. Of course you are going to get tired and you are going to say you have enough and stop it. I do not see anything in prolonging a method of nominating men for the office of President. You have all the time you need and all the opportunity. Therefore, I think this should stand as it reads.

DR. AXBY: Mr. President, if I understand the reason for this, it is to save time. That is the object, is it not? As far as the nominations are concerned, it resolves itself, as I understand it, into this: If you are going to nominate your friend, you be here on the first day and do it. If you are not here at that time, your friend is not going to be nominated. This is not going to hurt anybody very much, as I understand it.

I am going to suggest this, however. As I see it, this is a different way of voting, and I will say that this is going to give a minority organization an opportunity to take advantage of old-time politics before the Australian ballot system, and lead them up to the ballot-box through the influence they might be able to exert, and play politics. It can be done here all right. I am not saying I am against this system at all, but we already heard from one gentleman from Illinois (laughter) and probably we will hear from another one from Pennsylvania. I am here from Indiana. (Laughter) I will guarantee if this proposition were turned loose down in Indiana out of it would come something that wouldn't come out of Illinois or Pennsylvania.

If you are going to figure that every man is clean and he is so moral he won't play politics on the next day after the nominations are made, he will absolutely stay away from every other member, and he will not go out and electioneer; he will leave it to the man and his conscience, then this thing is fine. But if you do not take out the human side of it, there are possibilities here whereby before this meeting ever is in session, a minority organization can be formed, and they can put over whomever they please, wherever they please, at the time they please. (Applause)

SECRETARY HOSKINS: Mr. President, I think I understand what Dr. Hamilton is getting at. The ballots as proposed under this system will not contain the names of the nominees. We came to this meeting all prepared to hold an election under the new system, if necessary. The ballot, as we have prepared it,

contains one line opposite the word "President" on which you will write the name of the candidate for whom you wish to vote. Then there will be five lines, so that you can write in the names of the five for Vice-President and one for Treasurer, and every fifth year there will be a line on there for the member-at-large of the Executive Board.

I think Dr. Hamilton's question is may he not write in the name of someone for the office of President or Treasurer or Vice-President who has not been nominated. Is that correct?

DR. HAMILTON: Yes.

DR. MERILLAT: I was serious about this matter of having the ballot-box supervised, and I believe I had a conversation with Dr. Hoskins about it last year. I don't think we ought to impose upon the Secretary the responsibility of supervising that ballot-box. That should be delegated to the members of the Association. Dr. Hoskins will recall that I mentioned that to him in that many words. I think it would invite criticism for the Secretary and his office girls to look after these ballots. They probably would be handled better than the ballot-boxes in Pennsylvania, Indiana or Illinois. Nevertheless, it is a responsibility that I don't believe our Secretary should shoulder.

DR. J. S. KOEN: I don't believe that anybody other than the politician from Indiana would dare intimate that in this Association any politics would be attempted. (Laughter) However, it does occur to me that there is a very vital omission in the proposed amendment.

Suppose, for example, there were 601 voting members present and three candidates. One candidate from Pennsylvania would receive 200 votes, another from Illinois would receive 200 votes, and one from Indiana would receive 201 votes. Who would be elected? I fail to find any provision in this new amendment. In the old section it says very clearly that a majority of all votes cast shall be necessary to elect. In the new one I find nothing that determines how anyone shall decide who shall be or who has been elected. I wonder if that can be explained.

SECRETARY HOSKINS: Dr. Koen is absolutely correct in his contention. There was an unintentional omission, but it is one that is very easily corrected, and that is by simply going back and changing the word "majority" to "plurality."

DR. JOHN PATTERSON: I have been looking for something to prevent me from stuffing the ballot-box. I wonder if there is

provision made to prevent me from voting every fifteen minutes, providing the caretakers of the ballot-boxes don't know me.

SECRETARY HOSKINS: I will answer you and Dr. Merillat. Until Dr. Merillat brought it to my attention, I had not realized the tremendous responsibility which this new plan imposes on the Secretary. I was under the impression I would not have anything to do with it.

We would have a corps of clerks there, I do not know how many. We will have to find out by experience how large that corps will have to be. But we came here with an up-to-date list of members, with dues paid, and the ballots are numbered. Dr. John Patterson would walk into the room and ask for a ballot. The clerk would look on the list and see whether his dues were paid or not. Finding his dues were paid, she would issue ballot No. 1, and his name would be entered on the registry as having been given ballot No. 1. He would take that out in the hall, sit down in a corner, fill it in, then drop it in the box. Dr. John Patterson has cast ballot No. 1; he is checked off. I do not believe you could get another ballot if you tried to do it.

DR. PATTERSON: I won't try it.

DR. KINSLEY: Mr. President, I want to call Dr. Hoskins' attention to the fact that in some of these places, not in Missouri, I could go in and vote for myself and call for another man's ticket who is not here but in good standing. The clerks do not know the members.

Because of the apparent omissions I move that Articles 8 and 9 be laid on the table for a year.

. . . . The motion was regularly seconded. . . .

PRESIDENT HILTY: That is an amendment to Dr. Cary's motion for the adoption, isn't it?

DR. KINSLEY: Yes. He made a motion, and I move an amendment that Articles 8 and 9 be laid on the table.

PRESIDENT HILTY: Or is yours a substitute motion?

DR. KINSLEY: I will make a substitute motion.

PRESIDENT HILTY: The question then is on the substitute motion, that the changes in Articles 8 and 9 be laid on the table for one year. Are there any remarks?

DR. D. M. SWINEHART: I got in here late. Was there a second to Dr. Cary's motion?

PRESIDENT HILTY: Yes.

DR. SWINEHART: You will have to dispose of Dr. Cary's motion first, according to parliamentary procedure.

PRESIDENT HILTY: I stand corrected.

DR. FITCH: I would move than that Dr. Cary's motion be laid on the table.

DR. KINSLEY: I second the motion.

PRESIDENT HILTY: The question is on the motion made by Dr. Fitch that Dr. Cary's motion to adopt the changes in Articles 8 and 9 be laid on the table. Are there any remarks?

DR. CARY: This delays action. It has already been on the table for a year. We have had a good deal of experience in revising the Constitution and By-Laws. If you cut this out, of course, we will have to wait that time, but in the meantime there are a few objections that I think are correct; the questions of putting in what constitutes an election can be done by putting in the word "plurality." That will determine that part of it. This has been gone over twice by the Executive Board and also by a number of others.

I made the motion last year at Philadelphia to put all of these amendments over for a year, so you could digest and study them. If we are going to adopt a system like this, it looks to me as though this is workable if we will just add one or two words here and make it workable. If it doesn't work, you can get rid of it. But I believe on the question of electing and working for the President, and what we call political log-rolling, I don't think this will change it very much from what we already have had. We will still have some of that, probably just as much as we ever had. I am not saying that nobody can work for his friends. We are going to have that just as long as we have an organization of this kind.

But I believe we have a definite method here of controlling regular elections. Previous to this, very few men have been challenged at the ballot-box, in my experience, in this organization. Why? As we march up to the ballot-box and vote, as we do now, the President or any of the officers can't stand there and say, "That man has a right or has not a right to vote." If we come up there singly and put the ballot in the box any time tomorrow (and we have all day to do it), if there is any question about that, the Secretary can be called and his record can be looked up. I believe that it is necessary that we have something like this in order to stop some irregular voting. Otherwise, this process will be very much like the one we already have, except we will be voting all day instead of just a few minutes, in a rush, after a good deal of oratory.

I think we will have a safer, more regular vote than we have ever had if we adopt this. I think we might just as well do it this year as next year. I believe we should put the suggestion Dr. Hoskins made to determine the question of plurality.

DR. C. H. STANGE: Mr. President and Gentlemen: I would like to say just a word or two in regard to some of the thought that is back of some of these recommendations. It is the opinion of some of us that a large percentage of the veterinarians come to these meetings to hear scientific papers, to hear discussions which they can take back home and put into use. All we are attempting to do is to clear the programs of as much of this routine business as possible, so that we can have more papers and more scientific discussions.

We figured that last year we consumed about one day, something over eight hours, in transacting routine business in which a large percentage of the members were very little interested. What we are attempting to do is to get rid of a lot of this routine business by letting some committee handle it, and then let the members who come to these meetings perhaps once in five or ten years, whenever the meeting is held in their community, get something good and constructive out of the meetings. This is the thought back of a lot of these suggestions. I want you to think of that when you are taking action here, which will consume, as Dr. Cary has said, a lot of time on the part of the members, which should be devoted, in the opinion of some of us, to the reading of scientific papers and scientific discussions.

At the present time we have only one general session—I think that is an evening session—at which general papers can be presented, because we have so little time to have such papers read and discussed.

Some of us feel that that is really the important thing in connection with these meetings, and that the more routine business we can take care of in some other manner, the better it will be for the Association and the members, I just wanted to make that explanation because that is the thought back of a great many of these suggestions. (Applause)

PRESIDENT HILTY: The question is on Dr. Fitch's motion, whether Dr. Cary's motion shall be tabled for one year. All in favor of Dr. Fitch's motion will signify the same by saying "Aye"; contrary, "No." The motion is lost.

DR. KOEN: I move that the article as read be amended as follows: "That a plurality of votes cast shall constitute an election."

DR. CARY: I second the motion.

PRESIDENT HILTY: The question is on the amendment.

DR. C. H. HAYS: There is a motion before the house. Dr. Cary's motion is before the house.

PRESIDENT HILTY: The Chair stands corrected. The question is on the motion that we adopt the changes as read in Articles 8 and 9. Are there any remarks?

The question was called for, put to a vote and carried.

PRESIDENT HILTY: Now the question is on the amendment as proposed by Dr. Koen and seconded by Dr. Cary.

DR. KINSLEY: I rise to a point of order. This has been adopted. Can you amend it now for another year or two? It has been adopted by the vote just announced by the President.

DR. KOEN: I move that we reconsider the action just taken on Articles 8 and 9.

The motion was regularly seconded by several, was put to a vote and carried.

DR. KOEN: I move that Dr. Cary's motion be amended so that Article 9 shall read "A plurality of all votes cast shall be necessary to elect."

The motion was regularly seconded.

PRESIDENT HILTY: The motion is that it be amended to read, "A plurality of all votes cast shall be necessary to elect." The question is on the amendment. Are there any remarks? All in favor of the amendment signify by saying "Aye"; contrary "No." It is carried. The question is now on Dr. Cary's motion that we adopt. All in favor of this motion will signify the same by saying "Aye"; contrary "No." It is carried.

Secretary Hoskins read the proposed changes to Articles 10 to 16.

Article 10—Election of Members of Executive Board

Section 1. When a member of the Executive Board is to be elected from an executive board district, the Secretary shall send, at least six (6) months before the annual meeting, at which the member's term expires, a statement to each active member of the Association in said district that a member of the Executive Board is to be elected from the district. Said statement shall embrace a blank form, on which each such member shall make a nomination for the office of member of the Executive Board from said district. The nomination so made shall be submitted to the Secretary not later than four months before the next annual meeting. The Secretary shall prepare an official ballot, containing the names of the

five members receiving the first, second, third, fourth and fifth highest numbers of nominating votes so received, for the use of said members in voting by mail. In the event of a tie for fifth place, all nominees so tied shall have names included on the ballot. The mail ballots so voted shall be received by the Secretary not later than two months before the date of the annual meeting. The nominee receiving a plurality of the official ballots in proper form shall be declared elected.

In case of a tie vote, the President shall call a meeting of the members from the Executive Board district, in attendance at the annual meeting, and these members shall ballot for a choice between the tied nominees only. The member-at-large of the Executive Board shall be elected by ballot, by the active members of the Association in attendance at the annual meeting at which the term of office of the member-at-large expires.

Article 11—Installation

Section 1. The officers of the Association shall be installed at the last business session and shall assume their duties at the close of the annual meeting at which they are elected, except the Treasurer, Secretary, Editor and Business Manager, who shall assume their duties on the first day of January following said meeting.

Article 12—Sections

Section 1. The Association shall be divided into the following sections.

- A. General Practice.
- B. Sanitary Science and Food Hygiene.
- C. Education and Research.
- D. Small Animals.
- E. Poultry.

The Executive Board may make additional sections as deemed expedient.

Section Officers

Section 2. No change.

Chairman of Section

Section 3. The chairman shall preside at all meetings of the section and shall perform the usual duties belonging to such office.

Secretary of Section

Section 4. The secretary shall keep an accurate record of the proceedings of the section. He shall, in cooperation with the Committee on Program, arrange the program of the section for the annual meeting.

Length of Paper

Section 5. A maximum of twenty minutes shall be allowed for the presentation of a paper, and five minutes for each speaker taking part in a discussion. The author shall be allowed to reply to questions and criticisms at the end of the discussion.

Papers Read by Title

Section 6. No change.

Property of Papers

Section 7. No change.

Article 13—Editor and Business Manager

Section 1. The offices of Editor of the JOURNAL, and business manager of the JOURNAL may be combined and the two offices filled by one individual. Either or both said offices may be held by the Secretary of the Association.

The JOURNAL of the American Veterinary Medical Association shall publish the proceedings, transactions, papers and such other matters as the Editor may select.

Article 14—Invited Guests

Section 1. No change.

Article 15—Registration

Section 1. No change.

Section 2. No change.

Article 16—Honorary Members

Section 1. Nominations for honorary membership shall be submitted to the Executive Board, accompanied by a brief statement setting forth the accomplishments of the nominee upon which a right to honorary membership may be based. Such nominations shall be in the hands of the chairman of the Executive Board not later than the second day of regular meeting of the Association. The nomination shall be considered at the next meeting of the Executive Board. If the action of the Executive Board shall be unfavorable to the nominee, the nomination shall be returned to the nominator and no report made to the Association. If the action shall be favorable, the Board shall so recommend and present the nomination for action of the Association. An interval of at least twenty-four hours shall elapse between the nomination and the election. Not more than three honorary memberships may be conferred in any one year.

PRESIDENT HILTY: What shall be done with the proposed changes in Articles 10 to 16?

DR. WHITE: I move their adoption.

The motion was regularly seconded, put to a vote and carried.

DR. MERILLAT: I move the adoption of the whole pamphlet.

SECRETARY HOSKINS: You can't do that because all proposed changes are not in the pamphlet.

DR. MERILLAT: Read those that are not in the pamphlet.

SECRETARY HOSKINS: These proposed amendments are not available, in either printed or multigraphed form, because they were really not fixed up until the last minute. If you will turn to page 238 of the reprint, you will find the proposed amendment to Section 3 as it was proposed at Philadelphia a year ago. It has been found desirable to make certain minor alterations, and I am going to read the proposed Section 3 in its latest form.

Secretary Hoskins read proposed Sections 3, 8, 9 and 10.

Article 17—Standing Committees

Section 3. The Committee on Education shall consist of five members who shall be appointed by the President, each to serve five years, provided, however, that the first Committee to be appointed under this section shall serve for the following terms: one for one year, one for two years, one for three years, one for four years and one for five years. At least three members of the Committee at all times shall be members of veterinary faculties of veterinary colleges, recognized by this Association. No two shall be members of the same faculty or graduates of the same institution.

The Committee shall study and report annually upon the progress and needs of veterinary education, in correlation with other branches of

education and the live stock industry. If necessary the Committee shall inspect veterinary colleges from time to time and recommend annually a list of such colleges as should be recognized by the Association.

Section 8. The Committee on Veterinary Biological Products shall consist of five members to be appointed by the President, with the approval of the Executive Board, as follows: a representative of the producers of commercial biological products, a representative of the Federal Bureau of Animal Industry, a veterinarian conducting research work and not connected with a commercial concern, a general practitioner, and a state or provincial regulatory veterinarian. The first Committee appointed under this section shall consist of five members, whose terms of office shall be as follows: one for one year, one for two years, one for three years, one for four years and one for five years. After the first year, the term of office for all members appointed shall be five years. The President shall select the member to act as chairman of the Committee.

Section 9. The Committee on Proprietary Pharmaceuticals shall consist of five members, to be appointed by the President, with the approval of the Executive Board. A majority of the Committee shall at all times consist of members actively engaged in either teaching or research work in the field of pharmacology and therapeutics. The terms of office of the members of the first Committee appointed under this section shall be as follows: one for one year, one for two years, one for three years, one for four years and one for five years. After the first year, the term of office for all members appointed shall be five years.

Section 10. The President shall appoint the chairman of each committee provided in Sections 3, 4, 6, 7, 8 and 9. In the case of the Committee on Veterinary Biologies, the Committee on Proprietary Pharmaceuticals, the Committee on Education and the Committee on Legislation, the chairman shall be appointed from the hold-over members.

The motion of Dr. Merillat was seconded by several members and the question called for.

The following proposed changes were placed before the members present, in printed form, but the reading of these was dispensed with by motion duly made, seconded and carried.

Article 17—Standing Committees

Section 1. There shall be the following standing committees.

1. Budget.
2. Education.
3. Legislation.
4. Program.
5. Resolutions.
6. Policy.
7. Veterinary Biological Products.
8. Proprietary Pharmaceuticals.

Section 2. The Committee on Budget shall consist of the President, First Vice-President, Secretary, Treasurer and chairman of the Executive Board. The Committee on Budget shall study the financial condition of the Association and recommend a budget of expenditures for the ensuing year, for approval by the Association, at each annual meeting.

Section 4. The Committee on Legislation shall consist of five members, each appointed for a term of five years.

Section 5. The Committee on Program shall consist of the secretaries of the various sections and the secretary of the Association, who shall act as chairman. The Committee will arrange the literary program and clinic for each annual meeting.

Section 6. The Committee on Resolutions shall consist of five members appointed by the President each year.

Section 7. The Committee on Policy shall consist of five members as follows: the President, Secretary, Treasurer, chairman of the Executive Board, and one member to be appointed by the President.

Article 18—Resident Secretaries

Section 1. Each state, territory, province or country may have a resident secretary, appointed by the President.

Section 2. Each resident secretary shall cooperate with the President, Secretary, and Editor of the JOURNAL, in such a manner as they may direct.

Article 19—Code of Ethics

Section 1. Members of this Association are expected to conduct themselves at all times as professional gentlemen.

Section 2. No member shall assume an academic title or degree which has not been conferred upon him by an institution of learning in good standing.

Section 3. No member shall attempt to undermine or injure the professional standing of another by unfairly or unnecessarily criticizing his professional work.

Section 4. In all cases of consultation it shall be the duty of the veterinarian in attendance upon the case to give the opinion of the consulting veterinarian (whether favorable to his own or otherwise) to the owner of the patient in the presence of all three. In case of the absence of the owner the veterinarian consulted may, after giving his opinion to the attending veterinarian, transmit it in writing to the owner through the medical attendant. It shall be deemed a breach of this code for a consulting veterinarian to revisit a patient without a special invitation by the attending veterinarian or agreement with him.

Section 5. In advertising, a veterinarian shall confine himself to his address and telephone number. If a member operates a properly equipped hospital he may advertise that fact but such advertisement shall not list the facilities with which a hospital is ordinarily equipped nor list treatments which are ordinarily given in a hospital. In other words, no attempt shall be made to make it appear that the hospital is equipped with unusual apparatus or is administering treatment which is not ordinarily applied in a veterinary hospital unless such is actually the case. Large display advertisements and the use of cuts or pictures will not be countenanced. Advertising specific medicines, specific plans of treatment, or advertising through the medium of posters, illustrated stationery, newspaper puffs, etc., will not be countenanced by this Association.

Section 6. No member shall prepare or advertise or otherwise offer for sale any medicine or other remedy or prophylactic, the composition of which he refuses to disclose; nor shall he propose to cure by secret medicine, or guarantee a cure by secret medicine or otherwise.

Section 7. Each member shall observe the Code of Ethics adopted by this association and be answerable for any breach of the same. Charges of violation of this code shall be presented in writing to the Executive Board, which shall then proceed as provided in Article V, Section 7 (N), of the Constitution.

Article 20—Amendment to By-Laws

Section 1. No change.

Section 2. No change.

Section 3. No change.

PRESIDENT HILTY: It has been duly moved and seconded that we adopt the changes as printed and read from Article 17 to the end. Are there any remarks?

DR. FLOYD PERRIN: I think there is one part of this that is being overlooked and possibly railroaded, if I may use a term of

that kind. It is not proper to take up your time with something that the Executive Board has spent considerable time on, besides the subcommittee that worked on this. But the Code of Ethics that we are asked to accept, as it is read or as it has not been read, I think should be read carefully.

If you will go to the trouble of reading that you will note it is practically along the same lines as we have already had, and that it applies merely to the practitioner. We know that when our present Code of Ethics was adopted, we practically had one field of endeavor for the veterinarian, and that was general practice. Today, you know, there are several fields, and a good many engaged in them.

The only excuse I see for a Code of Ethics in our Constitution is stated in the "Purpose," and that is to promote good fellowship. I would like to have explained why you put the screws on the practitioner when we seldom see very much criticism between the practitioners. The criticism that seems to exist may be between the practitioner and some of those engaged in other lines of activity. If you care to have those related, it could be nicely done; you all know what they are. We have them between the practitioner and the Bureau men; we have the Bureau men and some engaged in commercial activities. We have instances of the Bureau men using their official capacities to enter into controversy between veterinarians engaged in commercial enterprises. There is plenty of evidence to show where some engaged in research work have caused friction between themselves and the practitioner.

Before final action on this, I would like to see it considered further. In going through this, as it now stands, you will notice they take special pains to take a rap at those who might unfortunately be engaged in conducting a hospital. It seems to me the Board has unconsciously overstepped its grounds in proposing the Code of Ethics to govern a hospital. If you would investigate the ownership of some of our hospitals, you probably would find they are not owned by those who are conducting them. Probably you never stopped to think of that.

In human medicine the A. M. A. does not attempt to lay down regulations governing the conduct of a hospital, but merely the relations that are connected with them.

I would propose that unless there are drastic changes in the proposed Code of Ethics, the entire article be omitted, beginning with Section 4. It serves no useful purpose. Just down to Section

4, you might say, governs the entire profession. By doing that, it leaves it to the judgment of the Executive Board to pass their opinion as to what is a violation of the Code of Ethics.

. . . The question was again called for. . . .

PRESIDENT HILTY: I declare Dr. Perrin's motion lost, as it was not seconded. There is a motion before the house. The question is on the adoption of the changes as printed and read, from Article 17 on to the end. All in favor of this motion will signify the same by saying "Aye"; contrary, "No." It is carried.

The next order of business will be the report of the Secretary-Editor.

. . . Secretary Hoskins read his report:

REPORT OF THE SECRETARY-EDITOR

MR. PRESIDENT AND MEMBERS:

As pointed out in the report made one year ago, it is becoming increasingly difficult each year to decide just what should be included in the annual report of the Secretary-Editor and what should be omitted. For some time we have clung to the policy of keeping our members informed, through the JOURNAL, of current activities of the Association. We believe that it is well to do so. The more closely we adhere to a policy of this kind the more repetition there naturally will be in each annual report if any attempt is made to give a comprehensive outline of the activities and accomplishments of each year.

Much progress has been made since the meeting in Philadelphia, last year. This progress is reflected in several ways. As will be shown in a later section of this report, the number of applications for membership received during the year exceeds the number for any year since 1919, which was one of the three big years occasioned by the late war, when so many new members were admitted to the Association while they were in military service in the various training camps. For the three years, 1917, 1918, and 1919, 2353 new members were admitted. An examination of the books shows that many of these veterinarians paid the application fee and dues for the first year, were admitted to membership and were never heard from again. In the light of experience it might be said that this was the natural outcome of high-pressure salesmanship used in influencing veterinarians to join the A. V. M. A.

APPLICATIONS FOR MEMBERSHIP

Applications for membership to the number of 420 have been received since our meeting in Philadelphia. There were 141 applications in process at the time of the 1927 meeting. These have been disposed of as follows:

Completed.....	372
Pending (9-1-28).....	46
Pending (10-1-28).....	43
Pending (11-1-28).....	96
Withdrawn and declined.....	3
Incomplete on account of technicalities.....	1
	<hr/>
	561

Since 1919 the following numbers of new members have been admitted each year:

1920—316	1925— 60
1921—211	1926—223
1922—165	1927—286
1923—198	1928—372
1924—254	

By way of explanation for the apparently low number admitted in 1925, it should be kept in mind that this was the year when we completely changed our system for filing applications and admitting new members. The figure represents only a fractional part of the usual twelve-month period.

DISTRIBUTION OF APPLICATIONS

Ohio.....	60	Dist. of Columbia.....	3
Minnesota.....	48	Florida.....	3
Iowa.....	34	Montana.....	3
Illinois.....	32	New Jersey.....	3
Missouri.....	28	Tennessee.....	3
Wisconsin.....	28	Colorado.....	2
South Dakota.....	21	Kentucky.....	2
Pennsylvania.....	20	Maryland.....	2
California.....	18	Virginia.....	2
Kansas.....	15	Washington.....	2
Michigan.....	15	Arkansas.....	1
New York.....	13	Connecticut.....	1
North Dakota.....	12	Louisiana.....	1
Indiana.....	11	Mississippi.....	1
Nebraska.....	10	North Carolina.....	1
Texas.....	6	Oregon.....	1
Massachusetts.....	5	Peru.....	1
Canada.....	4	Vermont.....	1
Alabama.....	3	West Virginia.....	1
Canal Zone.....	3		
		Total.....	420

Another indication of the progress which we have been making, slowly, but surely, is found in the number of members whom we are able to report with dues for the current year all paid up (See accompanying table. *) For recent years the figures are as follows:

1923—2995	1926—3032
1924—3017	1927—3218
1925—3094	1928—3447

The question may be asked, why the discrepancy between the number of paid-up members and the total membership reported each year. In this connection it should be pointed out that there are always several hundred members in arrears for dues. We are compelled to keep the name of a member on the roll for at least two years after he has failed to pay his dues.

Looking at these figures from the other end, we find that the number of members reported each year as being behind with their dues has been gradually decreasing from year to year. In the report for 1923 it was shown that we had 972 members on the books, a portion of whose dues remained unpaid. This figure for each succeeding year has been getting smaller, as shown by the following figures:

1923—972	1926—458
1924—758	1927—400
1925—511	1928—335

COMMITTEE WORK

It is the policy of the Association, as well as of the Executive Board, to transact a large portion of our business through committees. Just as soon as a particular activity of the Association becomes large enough, or important enough, it has been customary to have a committee to look after this particular activity. The best evidence of this policy that is available is the increasing list of committees. If it were not for these various committees, it would be incumbent upon the Secretary to include in his report much information concerning these particular activities that have been delegated to the different committees. The fact that each one of these committees will make a report at this meeting, either to the Association, or to the Executive Board,

*Corrected to September 20, 1928. A star (★) indicates 100% dues paid.

STATE	Pd.*	D-1†	D-2‡	Sp.§	Total
Alabama	31	4	2		37
Arizona	5	1	0		6
Arkansas	14	0	2		16
California	181	6	5		192
Colorado	38	4	3		45
Connecticut	37	4	1		42
*Delaware	13	0	0		13
Dist. of Columbia	46	2	0		48
Florida	31	4	3		38
Georgia	24	2	3		29
Idaho	20	2	3		25
Illinois	206	15	6		227
Indiana	144	10	8	1	163
Iowa	234	11	15		260
Kansas	105	2	6		113
Kentucky	45	4	4		53
Louisiana	28	1	4		33
Maine	13	1	3		17
Maryland	48	0	1		49
Massachusetts	80	1	0		81
Michigan	139	7	4		150
Minnesota	174	4	3		181
Mississippi	22	0	1		23
Missouri	112	4	10	1	127
Montana	14	0	1		15
Nebraska	78	2	2		82
*Nevada	9	0	0		9
New Hampshire	7	2	0		9
New Jersey	66	7	3		76
New Mexico	10	2	0		12
New York	222	11	6	2	241
North Carolina	39	2	8		49
North Dakota	35	1	0		36
Ohio	215	14	7		236
Oklahoma	35	3	1		39
Oregon	39	2	5		46
Pennsylvania	228	10	2	2	242
Rhode Island	5	2	0		7
*South Carolina	21	0	0		21
South Dakota	46	2	3		51
Tennessee	26	3	0		29
Texas	94	5	4	1	104
*Utah	13	0	0		13
Vermont	24	2	1		27
Virginia	38	4	2		44
Washington	44	2	1		47
West Virginia	22	0	1		23
Wisconsin	108	1	0		109
*Wyoming	7	0	0		7
*Alaska	2	0	0		2
Canada	142	13	8	2	165
Canal Zone	4	1	0		5
*Cuba	7	0	0		7
Hawaii	13	2	1		16
*Mexico	4	0	0		4
*Philippine Islands	17	0	0		17
*Porto Rico	3	0	0		3
*South America	4	0	0		4
Foreign	16	1	0		17
Honorary					47
	3447	183	143	9	3829

*Indicates dues for 1928 are paid.

†Indicates dues for 1928 are unpaid.

‡Indicates dues for 1927 and 1928 are unpaid.

§Special cases.

RECAPITULATION					
	Pd.	D-1	D-2	Sp.	Total
District No. 1.....	142	13	8	2	165
District No. 2.....	695	40	16	4	755
District No. 3.....	812	47	25	1	885
District No. 4.....	407	25	25	0	457
District No. 5.....	723	28	34	0	785
District No. 6.....	652	29	35	2	718
Foreign.....	16	1	0	0	17
Honorary.....					47
Totals.....	3447	183	143	9	3829

relieves the Secretary of the necessity of including a great deal of information in this report.

In this connection, however, time will be taken briefly to refer to the fact that the office of the Secretary-Editor has been cooperating, to a considerable extent, with a number of our standing and special committees. The facilities of the office have been placed at the disposal of those committees that could make use of such facilities as we have to offer. The preparation of lists, multi-graphing questionnaires, preparing circular letters, copying reports, and things of this kind are some of the ways in which we have been of assistance to committees during the past year.

No opportunity has been lost to develop and maintain contact with organizations of many kinds and individuals with various connections. Just a few of these will be enumerated without any further comment:

- American Medical Association
- American Public Health Association
- American Humane Association
- United States Public Health Service
- Boy Scouts of America
- United States Civil Service Commission
- United States Department of Commerce
- Federal Trade Commission

Although reference has been made in the JOURNAL to some of the outstanding events of the year, it is deemed advisable to refer to some of the more important in this report.

On January 1, 1928, with the approval of the Executive Board, our office space was enlarged almost 100 per cent. This made available additional room that was very badly needed for our expanding activities. It is believed that it will not be necessary for us to have any additional office space for at least another year.

COMMITTEE ON PROGRAM

The Committee on Program functioned for the first time this year and there is no better evidence of what this new committee accomplished than may be obtained from a careful examination of the program offered for this meeting. It is not everything that we expected to have it, but we believe that the progress made this year and the experience gained will profit us to just that extent next year. We gain experience and knowledge as we go along and this is certainly just as true of the work of the Committee on Program as in any other direction.

The Committee on Program met in the Association offices May 15, 1928. The expense of holding this meeting was \$211.10. We believe that the money was very well expended and recommend to the Committee on Budget that a sufficient appropriation be included in the budget for the coming year to take care of the expenses of the Committee on Program for that period. The amount should be sufficient to finance the holding of at least one meeting of the Committee on Program.

SPECIAL MEETING OF EXECUTIVE BOARD

On June 6, 1928, the Executive Board held a special meeting in Detroit. This was the first time that the Executive Board has met at the official head-

quarters of the Association. It is hoped that this meeting will become an annual feature of the affairs of the Association.

It would hardly be possible to exaggerate the advantages which exist in holding at least one meeting of the Board each year in the offices of the Association. Correspondence, documents, lists, files, reports, books and records of one kind or another are immediately available to the members of the Board in their deliberations on questions brought before them. Furthermore, a meeting of this kind is completely free of counter attractions, which cannot be said of the meetings which have customarily been held in connection with out annual conventions or the annual meetings of the United States Live Stock Sanitary Association in Chicago, each year. The meeting of the Executive Board this year was attended by five of the seven members. Dr. John R. Mohler, of District No. 4, and Dr. George H. Hart, of District No. 6, found it impossible to attend. The total expense of holding this special meeting of the Executive Board in Detroit was \$219.56.

ARMY ESSAY CONTEST

This year, in spite of an increased amount of publicity give to the contest, only two essays were submitted from approximately 140 eligible senior veterinary students in the thirteen colleges. In the opinion of the judges, neither of these essays was of a grade to entitle it to an award. The Association has annually appropriated the sum of \$75.00 for this contest and it would appear inadvisable to continue the contest unless more interest is manifest in it.

JUNIOR MEMBERSHIP AND STUDENT CHAPTERS

Applications have been received during the year for the organization of student chapters in two more veterinary colleges, Ohio State University and Ontario Veterinary College.

These applications were made in due form and have been approved by the Executive Board. Both applications were received rather later in the college year, 1927-1928, and the chapters will not be fully organized until the opening of the approaching fall term. We now have seven student chapters on the roll with a total membership of 336.

MEMBERSHIP DIRECTORY

Although it was planned to publish another edition of the A. V. M. A. Membership Directory during the year, publication has been postponed until after this meeting, so that it will be possible to include our Constitution and By-Laws, with the revisions made at this meeting. It is planned to publish the names of our members grouped by states, rather than alphabetically, as heretofore. There is practically as much demand for state lists as there is for a complete alphabetical list. This is particularly true of the needs of our resident secretaries in connection with the solicitation of new members.

Numerous suggestions have been received from our members, all looking to making the membership directory a more useful publication. It will not be possible for us to adopt all of these suggestions that have been made, but one to which we have been giving serious attention is a plan to indicate in connection with the name of each member his college of graduation and the year. The advantages of adopting some such plan should be self-evident. Another suggestion to which we have given some serious thought is one to indicate, in connection with the name of each member, the branch of the profession in which he is engaged. This would have its advantages, but at the same time it presents quite a few difficulties. We have not given up the idea, however.

MEETINGS ATTENDED

It has been found possible for the President and Secretary to attend about the usual number of meetings throughout the year. As in previous years it has been necessary to decline a large number of invitations, mainly on account of conflict of dates of different meetings. We take the occasion again to urge the officers of state associations to coordinate their meetings in such a way as to avoid conflicts as much as possible and, at the same time, to schedule these meetings in such a way that it will be possible for a national officer, for example, to go from one meeting to another without undue loss of time and

unnecessary expense. It is inadvisable for either the President or the Secretary to attend a meeting of a state association in a distant part of the country, if it is not possible to combine, on the same trip, attendance at one or more other meetings. The time and expense are not justified.

Meetings attended by the Secretary, during the year, are as follows:

<i>Date</i>	<i>Place</i>	<i>Purpose</i>
1927		
Sept. 12-16	Philadelphia, Pa.	Amer. Vet. Med. Asso.
Nov. 14	Lansing, Mich.	Conference Commissioner of Agriculture
	E. Lansing, Mich.	Mich. State College Student Chapter A. V. M. A.
Nov. 30 to Dec. 2	Chicago, Ill.	U. S. Live Stock Sanitary Asso. Executive Board A. V. M. A. Nat'l Asso. B. A. I. Vets.
Dec. 7	Jackson, Mich.	Central Mich. Vet. Med. Asso.
1928		
Jan. 10	Madison, Wis.	Wisconsin Vet. Med. Asso.
Jan. 12-13	Ithaca, N. Y.	Cornell Veterinary Conference
Jan. 18-19	Des Moines, Iowa	Iowa Vet. Med. Asso.
Jan. 26	E. Lansing, Mich.	Michigan State College Short Course
Feb. 13-14	Jacksonville, Fla.	Southeastern States Vet. Med. Asso.
Feb. 29	Toledo, Ohio	Northwestern Ohio Vet. Med. Asso.
Mar. 22-23	Columbus, Ohio	Ohio State Univ. Vet. Conference
June 26-27	E. Lansing, Mich.	Policy Committee A. V. M. A.
		Michigan State Vet. Med. Asso.

Meetings attended by the President, Dr. Reuben Hilty, are as follows:

<i>Date</i>	<i>Place</i>	<i>Purpose</i>
1927		
Nov. 29 to Dec. 1	Chicago, Ill.	Illinois State Vet. Med. Asso. U. S. Live Stock Sanitary Asso. Executive Board A. V. M. A. Nat'l Asso. B. A. I. Vets.
Dec. 13-14	Lincoln, Nebr.	Nebraska State Vet. Med. Asso.
1928		
Jan. 11-12	Columbus, Ohio	Ohio State Vet. Med. Asso.
Jan. 17-19	Indianapolis, Ind.	Indiana Vet. Med. Asso.
Jan. 23-24	Columbia, Mo.	Missouri Short Course for Vets.
Jan. 25-26	E. Lansing, Mich.	Michigan State College Short Course
Jan. 20	Washington, D. C.	Hearing—Appropriations Committee
Feb. 13-14	Urbana, Ill.	Univ. of Illinois Vet. Conference
Feb. 29	Toledo, Ohio	Northwestern Ohio Vet. Med. Asso.
Mar. 13	Fort Wayne, Ind.	N. E. Indiana Vet. Med. Asso.
Mar. 21-23	Columbus, Ohio	Policy Committee A. V. M. A. Ohio State Univ. Vet. Conference
May 15	Detroit, Mich.	Program Committee A. V. M. A.
June 6	Detroit, Mich.	Executive Board A. V. M. A.
June 27	E. Lansing, Mich.	Michigan State Vet. Med. Asso.
July 13	New York, N. Y.	New York State Vet. Society

CARD INDEX

Progress has been made in the compilation of our card index of graduate veterinarians of the United States and Canada. At the present time we have cards for approximately 12,250 graduate veterinarians. This represents an addition of about 1,000 cards during the year. As we approach the completion of this task, it becomes increasingly more difficult. This is particularly true of the graduates of some of the private veterinary colleges that went out of existence some years ago.

A complete new addressing system has been installed and this has involved the making of approximately 5,000 new stencils. The principal use thus far has been in connection with the addressing of the envelopes for the JOURNAL

each month, although we have been able to make very good use of the equipment for addressing envelopes for other purposes. As stated in the report one year ago, our aim eventually is to have a complete set of stencils for all veterinarians actively identified with the profession in the United States and Canada. There is quite a demand for addressing of one kind or another, applying to both members and non-members of the A. V. M. A. The stencils for non-members will be quite useful in connection with membership campaigns in the various states.

It should be pointed out that there is not available any published list of all of the veterinarians in the United States and Canada. Such lists are published for most of the other professions. In the course of a year we receive quite a few inquiries for such a list. It is believed that by making such a list available to legitimate users and making a nominal charge for the service, we can derive sufficient income to offset a considerable portion of the expense involved in keeping our list up to date.

PUBLICITY

The veterinary profession received its share of publicity during the past year, most of which was favorable. A great deal of publicity was given the Philadelphia meeting and the proposal to change the name "veterinarian." Approximately 5300 newspaper clippings were received during the year. Rabies and tuberculosis were the diseases to receive by far the most newspaper space. Quite a little attention was directed to the prospective shortage of veterinarians, these articles apparently having been inspired by a press release from the U. S. Department of Agriculture.

The two addresses by Dr. Raymond A. Pearson, "The Veterinary Profession: Its Recognition and Personnel," and "The Growing Importance of the Veterinary Profession," published in the JOURNAL during 1927, were reprinted and given wide distribution through various channels. About 4,000 reprints of the two addresses have been sent out. It is our intention to reprint the address by President Morgan, of the University of Tennessee, entitled, "The Place of Veterinary Medicine," published in the August, 1928, issue of the JOURNAL and use it for publicity purposes.

We have occasionally emphasized the necessity for being careful in making statements for public consumption lest these be misinterpreted or even actually used to our detriment.

As a case in point, reference is made to a book which recently made its appearance in the form of a veterinary encyclopedia. In this book the publishers have attempted to "carry water on both shoulders" in producing something believed to have an appeal to stock-owners and veterinarians. In attempting to promote the sale of this book, the publishers sent a circular letter to all county agents in the United States. The introductory paragraph of this letter reads as follows:

"Nowadays, when it's becoming harder every year to get quick and dependable veterinary service, every stock owner has need for reliable information on animal diseases and injuries."

Copies of this letter found their way into our hands and we took up with the publishers the unfairness of the implication in the paragraph of the letter as quoted.

We received a courteous reply from the publishers and in their defense they stated that it was not their intention to imply that veterinary service was not dependable. Furthermore, they referred to a statement made to them in a letter written by the dean of one of our largest veterinary colleges which reads as follows:

"The diminution in the number of veterinary students has resulted in a scarcity of veterinarians in the country and many animal owners have difficulty in securing veterinary services."

The point to which we wish to direct attention at this time is that there may be a certain amount of danger in giving any publicity to the fact that there is an impending shortage of veterinarians. Someone is sure to use this information as capital for promoting activities of one kind or another which are not in the best interests of our profession or the live stock industry.

SALMON MEMORIAL FUND

This fall the first income from the Salmon Memorial Fund will be made available to a junior veterinary student to be selected by the Executive Board from among nominations made by the deans of our different veterinary colleges. The details of the plans for making the award were worked out during the year by Treasurer Jacob and the Secretary. The Salmon Memorial Fund, amounting to approximately \$6,000, has been invested to yield \$300 per year and this entire amount will be given to the junior veterinary student selected every other year. The student receiving the award will have \$600 available during his junior and senior years. In all, there will be four payments of \$150 each.

At the request of the officers of the Intermountain Live Stock Sanitary Association, Dr. B. T. Simms, of Corvallis, Ore., was delegated to attend the annual meeting in Ogden, Utah, in January, as the representative of the A. V. M. A. Dr. Simms has made a report of his attendance at that meeting.

Journal

The JOURNAL has had a good year. The proceedings of the Philadelphia meeting were published in the November, 1927, issue of the JOURNAL, with the exception of the proceedings of the several sections. These appeared in the December issue. Up to and including the August, 1928, issue thirty-nine of the papers presented at the Philadelphia meeting have been published. It required 425 pages in the JOURNAL to accommodate these thirty-nine papers. It necessitated 140 pages to take care of the proceedings, making 565 pages that have been devoted to publishing the transactions of the 1927 convention. There are two manuscripts awaiting publication and we are awaiting the manuscripts of seven papers presented at the meeting, but not turned in.

The time has arrived when we should be giving some consideration to handling the increased number of papers that are being presented at our annual conventions. This year there are exactly fifty papers listed on the program. There are available, on an average, approximately 1000 pages for the publication of papers in a twelve-month period. This allows one issue of the JOURNAL for the publication of the proceedings of the United States Live Stock Sanitary Association and one issue for the proceedings of our own annual convention. Under present conditions about one-half of the space available for original papers is required to accommodate the papers that are presented at each annual convention. The gradual increase in the amount of space required for handling these papers results in a corresponding decrease in the amount of space that is available for publishing other papers offered to the JOURNAL. During the past year we have found it necessary to decline much valuable material simply because we were so crowded for space and because we had on hand so much material awaiting publication.

CHANGE IN VOLUMES

With the approval of the Executive Board, we have made changes in our volumes, with a view to having these coincide with the calendar year. In volume lxxii we published seven numbers and will do the same with volumes lxxiii and lxxiv. Volume lxxii was concluded with the issue of April, 1928. Volume lxxiii will be concluded with the issue of November, 1928, and volume lxxiv will be concluded with June, 1929. Then we will return to the plan of having each volume consist of six numbers and from that time on there will be two volumes published in each calendar year, beginning with the January and July numbers. This will result in the removal of considerable confusion that has existed in the past, both in connection with subscriptions and references. Heretofore, the even volumes of the JOURNAL have been published part in one year and part in another.

Our fourth special issue devoted exclusively to papers on poultry diseases was published in February, 1928. The proceedings of the 1927 meeting of the United States Live Stock Sanitary Association were published in the March issue. These have been the only special numbers published during the year.

It is gratifying to note the increasing number of good case reports which we have received and published during the year. Many of these have been contributed by veterinarians engaged in general practice.

ADVERTISING RATES

Upon the recommendation of the Executive Board, advertising rates in the JOURNAL have been increased 25 per cent. The increased rates have been put into effect with all new advertising and the rates are going into effect with our old advertisers just as rapidly as their old contracts expire. The increased receipts from advertising should begin to show themselves very soon. It is pleasing to report that only one of our old advertisers has declined to continue with us at the increased rates. The July issue of the JOURNAL contained more paid advertising than any other one number of the JOURNAL published during the past five years. It might also be said that the circulation for July was at a higher point than we have been able to reach previously.

JOURNAL CIRCULATION

Six months ending December 30, 1926.....	4049
Six months ending June 30, 1927.....	4114
Six months ending December 31, 1927.....	4230
Six months ending June 30, 1928.....	4384

JOURNAL CONTENTS

(Calendar year 1927)

Editorials.....	46
Papers.....	93
Case reports.....	33
State board examinations announced.....	5
Meeting dates announced.....	188
Meetings reported.....	94
Book reviews.....	20
Abstracts.....	20
Commencements reported.....	14
Obituary notices.....	89
Personal items.....	562
Miscellaneous items.....	317
Communications.....	12
Publications received.....	117
Army veterinary service announcements.....	12
A. V. M. A. proceedings (pages).....	140
U. S. L. S. S. A. proceedings (pages).....	264
Illustrations.....	237

JOURNAL FINANCES

July 1, 1927—June 30, 1928

Income

Advertising, subscriptions, reprints*.....	\$11,871.00
Association dues.....	12,225.88
	<hr/>
	\$24,096.88

Expenses

Rent.....	\$ 1,023.00
Salaries.....	4,720.00
Printing Journal (twelve issues).....	12,928.99
Envelopes.....	174.48
Postage.....	747.66
Half-tones, etchings, etc.....	649.93
*Reprints.....	1,473.16
Office equipment.....	683.00
Sundry expenses†.....	291.14
	<hr/>
	\$22,691.36

*Amounts offset each other, as reprints are supplied at actual cost.

†Includes \$62.65 for old journals.

ACKNOWLEDGMENTS

Your Secretary-Editor hereby expresses his most sincere thanks for the whole-hearted support and assistance given him by all of the officers of the Association, the members of the Executive Board, the resident secretaries and the various committees. If it had not been for the splendid cooperation given by all of these bodies and individuals, it would not have been possible to record the marked progress made during the year just coming to a close.

H. PRESTON HOSKINS,
Secretary-Editor.

PRESIDENT HILTY: What shall be done with this splendid report?

DR. IVENS: I move it be accepted as read.

The motion was regularly seconded, was put to a vote and carried.

PRESIDENT HILTY: The next in order is the financial statement of the Treasurer.

TREASURER JACOB: The financial statement at this time will be very brief and will take up only a few minutes of your time, for the reason that our annual report is made at the end of the fiscal year, which is December 31, and the statement for the year 1927 has already appeared in detail in the JOURNAL.

Treasurer Jacob read his report.

FINANCIAL STATEMENT

DECEMBER 31, 1927—JULY 26, 1928

Bank balances, December 31, 1927.....	\$ 6,176.90
Less outstanding checks paid.....	1,017.87
Actual cash balance, December 31, 1927.....	\$ 5,159.03
Receipts, January 1, 1928, to July 26, 1928.....	20,661.64
	\$25,820.67
Expenditures, same period.....	22,387.26
Balance.....	\$ 3,433.41
... Journal Fund.....	\$ 287.45
Placed on time deposit ... Relief Fund.....	72.00
... Schmidt Memorial Fund....	282.00
	641.45
Amount of cash in checking accounts, July 26, 1928.....	\$ 2,791.96
Revolving fund in hands of Dr. Hoskins.....	\$ 500.00
Loan to Relief Fund.....	100.00
	600.00
Amount of cash exclusive of time deposits.....	\$ 3,391.96
Cash on time deposit, December 31, 1927.....	\$15,015.89
Additional during period (Journal Fund and Relief Fund).....	359.45
Total amount now on time deposit.....	15,375.34
Total cash resources.....	\$18,767.30
Bonds (purchase price).....	24,935.20

Total assets, July 26, 1928.....	\$43,702.50
Total assets, December 31, 1927.....	45,710.12
Decrease for period.....	\$ 2,007.62

DISTRIBUTION OF ASSETS

<i>Fund</i>	<i>Cash</i>	<i>Bonds (Cost)</i>	<i>Time Deposits</i>	<i>Totals</i>
A. V. M. A.....	\$1,838.74	\$13,445.93		\$15,284.67
JOURNAL.....	1,553.22	9,509.01	\$14,660.11	25,722.34
Relief.....		1,980.26	715.23	2,695.49
	\$3,391.96	\$24,935.20	\$15,375.34	\$43,702.50

A. V. M. A. FUND

Bank balance, December 31, 1927.....	\$ 815.57
Less outstanding checks paid.....	285.69

Balance.....	\$ 529.88
Revolving fund in hands of Dr. Hoskins.....	500.00
Loan to Relief Fund (see 1927 report).....	100.00
Borrowed from Journal Fund.....	4,000.00
Receipts during period.....	5,781.11

Total.....	\$10,910.99
Expenditures during period.....	8,790.25

Balance.....	\$ 2,120.74
Transfer to Schmidt Memorial Fund.....	282.00

Balance.....	\$ 1,838.74
Loan to Relief Fund.....	\$ 100.00
Revolving fund in hands of Dr. Hoskins.....	500.00
	600.00

Balance, July 26, 1928.....	\$ 1,238.74
Actual bank balance, July 26, 1928.....	\$ 1,275.14
Less checks not cashed.....	36.40
Balance.....	\$ 1,238.74

JOURNAL FUND

Bank balance, December 31, 1927.....	\$ 5,361.33
Less outstanding checks paid.....	732.18

Balance.....	\$ 4,629.15
Receipts during period.....	\$14,808.53

Total.....	\$19,437.68
Expenditures during period.....	13,597.01

Balance.....	\$ 5,840.67
Placed on time deposit.....	287.45

Balance.....	\$ 5,553.22
Loan to A. V. M. A. Fund.....	4,000.00

Balance, July 26, 1928.....	\$ 1,553.22
Actual bank balance, July 26, 1928.....	\$ 2,818.51
Less checks not cashed.....	1,265.29

Balance.....	\$ 1,553.22
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SCHMIDT MEMORIAL FUND

Amount on time deposit, December 31, 1927.....	\$ 719.32
Received from Secretary.....	\$ 282.00
Interest on time deposits.....	13.75
	<hr/>
	295.75
Total.....	\$ 1,015.07
Checks to Dr. H. Jensen.....	1,015.07
	<hr/>
Balance.....	None

SALMON MEMORIAL FUND

Amount of Fund, December 31, 1927.....	\$ 6,120.55
Interest on Fidelity Trust Company 5½% Bonds.....	151.25
Interest on time deposit.....	2.68
Rebate on bonds.....	13.75
	<hr/>
	\$ 6,288.23
Invested as follows:	
Fidelity Trust Company 5½% Bonds.....	\$ 5,500.00
Liberty Loan Bond.....	500.00
Certificates of deposit.....	288.23
	<hr/>
	\$ 6,288.23

RELIEF FUND

Amount on time deposit, December 31, 1927.....	\$ 643.23
Interest during period.....	72.00
	<hr/>
Total cash.....	\$ 715.23
Invested as follows:	
Bonds.....	\$ 1,980.26
Time deposit.....	715.23
	<hr/>
Total amount of Fund.....	\$ 2,695.49
Less amount due A. V. M. A.....	100.00
	<hr/>
	\$ 2,595.49

PRESIDENT HILTY: What is your pleasure with this report of the Treasurer?

DR. J. C. FLYNN: I move the report be adopted as read.

DR. AXBY: I second the motion.

. . . The motion was put to a vote and carried. . . .

SECRETARY HOSKINS: I have a cablegram here from Paris that contains just one word, from Dr. and Mrs. Mayo; "Greetings." (Applause)

PRESIDENT HILTY: We now stand adjourned.

. . . The meeting adjourned at 5:00 p. m. . . .

ADJOURNMENT

WEDNESDAY AFTERNOON, August 8, 1928

The third session convened at 2:15 p. m., President Hilty presiding.

PRESIDENT HILTY: The first thing in order for the afternoon is the report of the Executive Board.

SECRETARY HOSKINS: The Executive Board has held one meeting since the report made yesterday, but there was no business transacted that would require any recommendation at this time.

PRESIDENT HILTY: We come to the next order of business, the election of officers. The By-Laws provide that nominating speeches shall not exceed two minutes, so anyone speaking will please be governed accordingly. We are open for nominations for president.

DR. T. H. FERGUSON: Mr. Chairman, I would like to place before you for nomination for president of this Association the name of a veterinarian who has done a lot of hard work for the Association and the profession, and has accomplished a lot. Without taking up the prescribed two minutes, I will make my speech short by nominating Dr. T. E. Munce, of Pennsylvania. (Applause)

DR. H. D. BERGMAN: Mr. Chairman and Members: I would like to second the nomination of Dr. Munce, of Pennsylvania, for the presidency of this organization. I have known Dr. Munce for a good many years, and have been closely associated with him from time to time in the conduct of A. V. M. A. affairs. He is a tireless worker for the best interests of all of the veterinary profession. I know of no member of this organization who is better qualified, as to personality, experience and demonstrated administrative ability, to fill the most important position the veterinary profession of this country has to offer, than Dr. Munce.

His record of achievement in the Association and in his own state demonstrate this fact, and I assure you that the interests of the veterinary profession as a whole will be safeguarded with Dr. Munce at the helm. I deem it a very great privilege to second the nomination of Dr. T. E. Munce, of Pennsylvania, for the presidency of the American Veterinary Medical Association. (Applause)

DR. L. A. MERILLAT: Permit me to second that nomination. I should like to speak on behalf of our state, in the role of past president of the Association, and because of the wonderful help that Dr. Munce always gives to the presidents of this organization. At a conference we had a few days ago, in a conversation between Dr. "Daddy" Welch, of Illinois, who was once a presi-

dent, and Dr. T. A. Sigler, of Indiana, who was also a president, we marvelled at the wonderful help we received in our administrations from Dr. T. E. Munce. He is a tireless worker in behalf of the veterinary profession—not one branch, but all.

I believe it would be of great benefit to this Association to have Dr. Munce not only on the Executive Board but to serve a year as the wheel-horse of the organization. (Applause)

DR. T. A. SIGLER: I wish to second the nomination of Dr. Munce.

DR. C. P. FITCH: Mr. Chairman, it is indeed a great privilege to have the opportunity of seconding the nomination of a man who stands for the advancement of veterinary medicine as does Dr. Munce.

As you all know, I am particularly interested in the research aspect of veterinary medicine. It has always been my belief, and it is still my belief, that if the control organizations of this country would devote more attention and more funds to the research aspects of veterinary medicine, their duties in the control of animal diseases in the commonwealths which they represent would be greatly simplified.

Dr. Munce has typified the advancement of this idea. The research organization which he has established in the commonwealth of Pennsylvania is equalled by no other research organization in a control organization in the United States, and even though, the past year, he took from my own organization one of my best men, I wish them all well. I take great pleasure in seconding the nomination of Dr. Munce. (Applause)

DR. J. C. FLYNN: Mr. Chairman, I have never had the pleasure of close association with Dr. Munce. I do not know him personally as well as I know his record and his reputation. A man's reputation and his record may travel faster and farther than he himself is able to travel. I have gained from the knowledge of his reputation the facts that make me believe he will be the proper man to lead this organization for the next year, and it is with pleasure that I second Dr. Munce's nomination. (Applause)

PRESIDENT HILTY: Are there any other nominations?

DR. D. S. WHITE: Mr. President, quite unsolicited—Dr. Munce doesn't know anything about this, but it seems to me very proper to do it right now—I rise to second the nomination of Dr. Munce. As president of our sister organization, the United States Live Stock Sanitary Association, Dr. Munce

demonstrated his ability as the chief executive of an organization of this type.

I have known him for many years rather intimately and I know of no one in the profession who works harder and more directly toward the good of our profession. It is therefore a privilege to second his nomination. (Applause)

DR. J. S. KOEN: Mr. President, it seems that once again we are all united behind a single individual to lead the Association. Surely time has been given for other nominations if other nominations were to be placed before us. I therefore move that the By-Laws be suspended and the Secretary be instructed to cast the unanimous vote of the Association for Dr. Munce for president.

DR. FITCH: I should like to second that motion.

PRESIDENT HILTY: It has been duly moved and seconded that the nominations be closed and the Secretary instructed to cast the unanimous ballot of this Association for Dr. Munce as president. Are there any remarks?

. . . The question was called for, put to a vote and carried. . . .

PRESIDENT HILTY: The Secretary will cast the ballot of this Association for Dr. Munce for president.

SECRETARY HOSKINS: In accordance with your instructions, I take great pleasure in casting your unanimous ballot for Dr. T. E. Munce, of Harrisburg, Pennsylvania, for president of the American Veterinary Medical Association for the ensuing year. (Applause)

PRESIDENT HILTY: The next in order will be nominations for five vice-presidents. You can nominate as many as you desire, but only five will be elected.

DR. C. A. CARY: Mr. President, I take great pleasure in nominating Dr. O. M. Norton, of Mississippi, to represent the South as vice-president.

DR. ADOLPH EICHORN: Mr. President, I take pleasure in nominating one who has been active in veterinary research problems for many years. He has quite an enviable reputation and, furthermore, comes from our friendly neighbor, Canada. I take pleasure in nominating Dr. Seymour Hadwen, of Canada.

DR. C. E. COTTON: It has been the custom of this Association for a great many years to recognize one of the Army men in our profession by giving him one of the vice-presidencies. It gives me pleasure to nominate, as one of the vice-presidents, Lieu-

tenant-Colonel Robert C. Musser. Colonel Musser was an efficient veterinarian during the World War, when stationed in California. He later served his division as veterinarian in the Philippines. He is now the Commandant of the Army Veterinary School in Washington.

DR. H. M. HAMILTON: Mr. President, I should like to place in nomination for vice-president of this organization a practitioner who has devoted his entire lifetime to the profession as a general practitioner. He has been a member of this organization for some twenty years. He is a man whom I would like to place in nomination as a representative of the Middle West. I don't think this man needs much introduction to this audience. Therefore, I take pleasure in presenting for your consideration Dr. W. A. Axby, of Harrison, Ohio.

DR. W. M. BELL: I want to nominate one who has been a member of the Association and has worked for the best interests of the veterinary profession for many years. He is now State Veterinarian of Tennessee, Dr. Willis B. Lincoln.

DR. R. S. MACKELLAR: I wish to place in nomination the name of a man who has served faithfully in his state organization, his local organization and in health matters in the State, namely Dr. W. G. Hollingworth, of Utica, New York. He is unable to be present here because his dear old mother is lying at the point of death. That is the only reason he isn't here today.

PRESIDENT HILTY: Are there any other nominations?

DR. CARY: I move that nominations be closed and that we proceed to ballot.

DR. SIGLER: I second the motion.

PRESIDENT HILTY: It has been duly moved and seconded that nominations be closed, and that we proceed to vote by ballot. All in favor of this motion signify by saying "Aye"; contrary, "No." It is carried.

The following will please act as tellers. Will you kindly step to the platform? Dr. C. W. Fogle, Dr. William Moore, Dr. A. J. Thompson, Dr. W. A. Hagan, Dr. R. P. Marsteller and Dr. C. C. Palmer.

It must be understood, gentlemen, that nobody excepting a man who holds a 1928 membership is eligible to vote.

. . . The members proceeded to vote. . . .

PRESIDENT HILTY: We will ask the tellers to retire now and count the ballots for vice-presidents.

The next in order will be nominations for treasurer.

DR. CARY: Mr. Chairman, I wish to put in nomination the man who has held the office for several years so faithfully and successfully. It is the kind of office that does not carry much with it. This man has held it so well and so satisfactorily to this organization that I do not see any reason for turning him out. That would be the thing to do with an unfaithful worker, but this man has been so faithful and active and never found wanting, I deem it a pleasure to nominate Dr. Jacob, of Knoxville, Tennessee, for treasurer to succeed himself. (Applause)

DR. SIGLER: I second the nomination of Dr. Jacob.

PRESIDENT HILTY: Anyone else?

DR. W. H. IVENS: I move the nominations for treasurer be closed.

. . . The motion was regularly seconded, was put to a vote and carried. . . .

DR. CARY: I move that that part of the By-Laws be suspended and that the Secretary cast the unanimous ballot for Dr. Jacob as treasurer.

. . . The motion was regularly seconded, put to a vote and carried. . . .

PRESIDENT HILTY: The Secretary will cast the ballot of the Association for Dr. Jacob.

SECRETARY HOSKINS: In accordance with your instructions, I hereby cast the unanimous ballot of the Association for Dr. M. Jacob, of Knoxville, Tennessee, for the office of treasurer of the American Veterinary Medical Association for the term beginning January 1, 1929. (Applause)

PRESIDENT HILTY: As is customary at this time, the Association will receive invitations from places where it is desired to have the Association meet next year. While the tellers are out counting the ballots for vice-presidents we will receive such invitations.

DR. JOHN R. MOHLER: Mr. President, along this line, I have a letter from the chairman of the Legislative Committee, in Washington, Dr. John P. Turner, as follows:

DEAR DR. MOHLER:

At the regular meeting of the Veterinary Club of the District of Columbia, it was unanimously decided to invite the American Veterinary Medical Association to hold its next annual meeting in Washington. Will you kindly extend this invitation to the Association and assure them that Washington, the great city of conventions, will give them a hearty welcome.

On behalf of the Veterinary Club of the District of Columbia, of the Bureau veterinarians there located, of the Army Veterinary Corps, I extend to you a most cordial, a most sincere and a most hearty invitation to visit us in Washington at your next annual meeting in 1929.

This invitation is backed by the Maryland State Veterinary Medical Association, by the Virginia Veterinary Medical Association, and by the veterinarians of North Carolina and West Virginia.

Washington, as you may know, is a great convention city. We have the Chamber of Commerce there; we have the Board of Trade, but we do not have any convention promoters. It is the opinion of the citizens in Washington that Washington belongs to you. As a matter of fact, there is not a veterinarian in the city of Washington who was born or raised in the City. We are there merely as transients. The city form of government is that of the commission type. The commission is appointed by whoever the President may be, and consists of a Democrat, a Republican and an engineer in the Army.

The laws that govern the city of Washington are made by men whom you nominate and elect in your home town. Your Senators and your Representatives are the men who rule the city of Washington. Therefore, the money appropriated for buildings, the rules and regulations that govern our existence and public welfare there, you are incidentally responsible for.

It has now been more than thirty years since this organization met in the city of Washington. It has been several years since this Association met south of the Mason-Dixon line. For this reason and for the further reason that we in that section need the benefit of a visit from this Association, a most sincere and cordial invitation is extended to this Association for its next annual meeting.

I thank you. (Applause)

DR. E. M. PICKENS: On behalf of the Maryland State Veterinary Medical Association, I wish to second Dr. Mohler's invitation to come to Washington.

DR. S. E. HERSHEY: On behalf of the West Virginia Veterinary Medical Association, we extend to you an invitation to come to Washington. We have not got 10,000 lakes, or 11,000 lakes, but we have 15,000 points of interest around Washington.

DR. H. C. GIVENS: On behalf of the Virginia State Veterinary

Medical Association, we concur in Dr. Mohler's invitation that this Association come to Washington for the 1929 meeting.

PRESIDENT HILTY: Are there any other invitations?

DR. C. W. BOYD: Mr. Chairman, I received a telegram from the Pittsburgh Chamber of Commerce inviting us, but I am afraid the accommodations for clinics are not right at this time.

DR. B. J. KILLHAM: Mr. Chairman and Members of the Association: In Michigan we classify the veterinarians in three divisions. We started last year to prepare for a meeting of the A. V. M. A. in Detroit in 1929. At that time an invitation was extended by representatives of two of the three divisions. Dr. Ward Giltner, as Dean of the Veterinary Division of Michigan State College, invited you to come and meet with us in 1929, and Dr. E. E. Patterson, a practitioner, endorsed that invitation.

Now I come as a control official, as State Veterinarian, a member of the intermediate class, to present the invitation at this time. We are unanimous; we present a solid front. We have been working on this matter for a year. We are prepared to take care of this Association in a fitting manner and are requesting the honor of your presence.

We have in Michigan, I believe, considering our live stock population, a greater proportion of veterinarians than in most states in the Union. Disregarding the veterinarians who are not active, who have retired for one reason or another, we have consistently maintained over 500 active veterinarians in the State.

In the Detroit district we have approximately 100 veterinarians including the veterinarians in the Bureau and municipal services. We think we deserve some consideration from the standpoint of the interest in your Association taken by the Michigan veterinarians.

During the last four years, from 1924 to the present year, we have shown an increase, a net increase in membership of 24. At no time have we receded, in spite of resignations, deaths and removals; we have shown an increase each year.

According to the information I have been able to obtain, if the other states had done equally well in regard to membership, our organization would have within its fold, at the present time, 4800 members instead of the 3800 which we have.

I am not going to extol the virtues of Detroit. In all probability most of you are familiar with that city. We have purposely refrained from permitting promotion organizations, bureaus inter-

ested in conventions, and so forth, intervening in our effort to procure this meeting. We are presenting our pleas from the standpoint of the veterinarians only.

I am not going to tell you what the advantages of Detroit are because of its location, but just advise you it is across the river from Windsor, Ontario, Canada. (Laughter and applause) But we have a fortunate situation for conventions in Detroit at the present time, and that condition will obtain for some years. Detroit is overbuilt insofar as hotels are concerned. We have a large number of magnificent hotels. It is possible to obtain very good accommodations at extremely reasonable prices without any preliminary notice.

We have reason to believe that there are at least six or eight high-class hotels in Detroit that will give this Association anything it desires insofar as meeting accommodations are concerned, if we merely designate the hotel as the headquarters for the meeting.

When we started to prepare for the invitation to this organization, we went at it in a serious manner. We told the veterinarians of the State that it required a certain amount of money to finance a meeting of this kind. At the last annual meeting of our State Association, we were engaged in obtaining pledges. At this time I have in my possession pledges covering a substantial amount; we have secured nearly \$1,000 since the meeting, and we are in a position to say that we believe from the entertainment standpoint we can take care of you in a proper manner.

Those of you who attended the great battle of St. Louis, six years ago, out of which emerged our present Secretary-Editor, will recall the furious time we had. After his election or appointment, he located his offices in Detroit. The home of your Association has been in Detroit for six years. We believe it is now time for you, as members of the Association, to come to Detroit and look over your headquarters.

We are extending to you, therefore, an invitation coming in a whole-hearted manner from the veterinarians of Michigan. It is unanimous, and we trust that you will give us your support and an opportunity to demonstrate that we can act in a proper manner as hosts.

We certainly would appreciate the honor and privilege of working in that capacity. (Applause)

PRESIDENT HILTY: Anyone else? It seems that we have but two invitations. What shall be your pleasure as to the manner

of disposing of these? Shall they be referred to the Executive Committee, or shall they be voted on here?

DR. E. E. PATTERSON: I move a ballot be cast now.

DR. HAMILTON: I second that motion.

PRESIDENT HILTY: It has been moved and seconded that we vote on the proposition here. All in favor of this motion will signify the same by saying "Aye"; contrary, "No." What shall be your pleasure, shall it be a ballot vote or a hand vote?

DR. CARY: Mr. Chairman, I move we vote by ballot.

. . . The motion was seconded by several, was put to a vote and carried. . . .

. . . The members proceeded to cast their ballots. . . .

PRESIDENT HILTY: If the ballots are all prepared, we will ask the tellers to gather them.

DR. F. M. HAYES: Mr. President and Members: While this matter is being settled for 1929, I just want to take this opportunity, in behalf of the Pacific Coast, to extend an invitation to meet in Los Angeles in 1930. We believe in preparedness, in looking ahead a little bit. We want to get this as a matter of record at this meeting.

I might remind you that the city of Los Angeles is the only city of its size in the United States that has never entertained this Association. The Pacific Coast would like to have you out there. I am not going to take time at this meeting to tell you of the many advantages, or give you many reasons for coming out there in 1930. We will be back at the meeting next year with plenty of reasons, in fact sufficient, so I think you will not refuse to come to Los Angeles in 1930.

This invitation is in behalf of the California veterinarians, in fact the Pacific Coast veterinarians, and, of course, the California State Veterinary Medical Association.

Thank you. (Applause)

PRESIDENT HILTY: Are there any other invitations to be extended for 1930 or later?

DR. A. T. KINSLEY: Mr. President, last year we extended an invitation to this Association to meet in Kansas City in 1930. We have back of this invitation the veterinarians of the Kansas City Veterinary Association. Although we haven't the say of the Kansas veterinarians, we have of practically all of the Missouri veterinarians, the Chamber of Commerce and various organizations in Kansas City. We also will be at the meeting

next year to extend our invitation which was extended last year. (Applause)

PRESIDENT HILTY: If there are no others, while the tellers are counting these various ballots, we will proceed with the program of the afternoon. The next in order is the report of the representative to the National Research Council, Dr. Ward Giltner.

Dr. Ward Giltner read his report. . . . (Applause)

REPORT OF A. V. M. A. REPRESENTATIVE TO THE NATIONAL RESEARCH COUNCIL

MR. PRESIDENT AND MEMBERS:

Your representative to the National Research Council is assigned to the Medical Section. My term of representation—three years—has terminated. My successor is Dr. Wm. A. Hagan, of Cornell University. I wish to thank the Association for giving me the opportunity to represent American veterinary medicine in the scientific medical councils of the nation. I congratulate Dr. Hagan on the occasion of his assuming a pleasant duty, and assure the Association that it will be represented with the dignity and efficiency expected by all of us. The work of the Council is not spectacular, but it is worthy of all the support we can give it, and in turn we can expect support from it.

I have previously reported that our chief enterprise is a joint committee with the Section on Biology and Agriculture on bovine infectious abortion, organized under the chairmanship of Dr. Theobald Smith. The committee met on the Saturday following the 1927 meeting of the A. V. M. A., at the Veterinary School of the University of Pennsylvania. At this meeting a subcommittee reported on:

1. A standardization of the methods for detecting the presence of *B. abortus* antibodies in the blood of cows.
2. A plan for a study of the relation of deficiencies in nutritive requirements to abortion.
3. Dr. E. T. Hallman was asked to present technic for the pathological examination and recording the lesions of the fetal membranes of the cow.

I am not authorized to submit the full reports on these subjects, but I believe that the newly organized committee should make public its findings in full in some satisfactory manner.

The resignation of Dr. Smith as chairman and the death of Dr. Schroeder resulted in a reorganization of the committee, which is now constituted as follows:

- Dr. Ludvig Hektoen, Chairman, McCormick Institute for Infectious Diseases, Chicago, Illinois
- Dr. J. M. Buck, U. S. Bureau of Animal Industry, Washington, D. C.
- Dr. L. J. Cole, Department of Genetics, University of Wisconsin, Madison, Wisconsin
- Miss Alice C. Evans, Hygienic Laboratory, Washington, D. C.
- Dr. C. P. Fitch, University Farm, St. Paul, Minnesota
- Dr. Ward Giltner, Michigan State College, East Lansing, Michigan
- Dr. A. V. Hardy, Iowa State Public Health Service, Des Moines, Iowa
- Dr. E. B. Hart, Department of Agricultural Chemistry, University of Wisconsin, Madison, Wisconsin
- Dr. G. H. Hart, Department of Animal Husbandry, University of California, Davis, California
- Dr. J. R. Mohler, U. S. Bureau of Animal Industry, Washington, D. C.
- Dr. B. T. Simms, Oregon Agricultural College, Corvallis, Oregon
- Dr. William Crocker, Chairman of Section on Biology and Agriculture (ex officio)

It is my impression that this committee may serve as an advisory committee to the Bureau of Animal Industry in the event that Congressional appropriations are made available for research in abortion. It is interesting to note that the appearance of undulant fever in man in this country has stimulated the interest of doctors of human medicine to the extent that they desire greater representation on the committee on infectious abortion of cattle.

The National Research Council Committee on Problems for Research in Infectious Diseases has the following personnel: Drs. William Charles White, Chairman, Charles M. Armstrong, Secretary, Charles F. Craig and Ward Giltner.

The problem for study is: the fate of pathogenic organisms in the soil. The study will probably be made on plots of ground furnished by the United States Department of Agriculture, at Washington, D. C. A number of veterinary research men have made studies along this line, especially with the tubercle bacillus.

The Committee on Medical Problems of Animal Parasitology has a number of projects in view but no funds available for their furtherance.

WARD GILTNER.

DR. MOHLER: In addition to the members whose names Dr. Giltner read, the National Dairy Council has been requested to name three of its members on this Abortion Committee. They have selected Congressman Brigham, of Montana; Mr. A. J. Glover, editor of *Hoard's Dairyman*, and Mr. A. M. Loomis, secretary of the National Dairy Council. So there are three additional members to go on the Abortion Committee.

PRESIDENT HILTY: What is your pleasure with this report?

DR. F. B. HADLEY: I move its adoption.

. . . The motion was regularly seconded, was put to a vote and carried.

PRESIDENT HILTY: The Secretary will read the report of the tellers on the election of vice-presidents.

SECRETARY HOSKINS: The report of the Board of Tellers is as follows:

Dr. Hadwen	242 votes
Dr. Axby	235 "
Dr. Norton	231 "
Lt. Col. Musser	227 "
Dr. Hollingworth	182 "
Dr. Lincoln	164 "

Dr. Seymour Hadwen, of Canada, has been elected First Vice-President; Dr. W. A. Axby, Harrison, Ohio, Second Vice-President; Dr. O. M. Norton, Greenville, Mississippi, Third Vice-President; Lieutenant-Colonel R. C. Musser, U. S. Army, Washington, Fourth Vice-President; Dr. W. G. Hollingworth, Utica, New York, Fifth Vice-President.

PRESIDENT HILTY: Are these five men in the room? If they are, let them rise to their feet and let us get a look at them.

Dr. Norton, Dr. Axby and Dr. Hadwen. There are three of them here. (Applause)

PRESIDENT HILTY: We will now have the result of the ballot on the meeting-place for next year.

SECRETARY HOSKINS: The tellers report that Detroit received 213 votes and Washington received 84.

PRESIDENT HILTY: According to your ballot, we will meet in Detroit next year.

DR. MOHLER: I move that the Association give a unanimous vote to Detroit as the next meeting-place.

. . . The motion was seconded. . . .

PRESIDENT HILTY: It has been moved and seconded that a unanimous vote be cast by this Association to meet in Detroit in 1929. All in favor signify the same by saying "Aye"; contrary, "No." It is carried.

The next in order is the report of the representative to the Horse Association of America, Dr. H. R. Church.

SECRETARY HOSKINS: Dr. Church is the representative of the American Veterinary Medical Association on the Board of Managers of the Horse Association of America. He was unable to attend this meeting but has sent his report. I will read it.

. . . Secretary Hoskins read the report. . . . (Applause)

REPORT OF A. V. M. A. REPRESENTATIVE ON THE BOARD OF MANAGERS OF THE HORSE ASSOCIATION OF AMERICA

MR. PRESIDENT AND MEMBERS:

The work of the Horse Association of America has been continued along the same general lines as reported by your representative a year ago, at which time a somewhat detailed outline of activities was given.

Investigations have shown that there are many ways in which horses and mules may be made more valuable to users. The most important of these probably is the use of horses in larger teams. Planning farm work so that maximum results are secured from teams is receiving increased attention and offers great possibilities.

At the last annual meeting of the Horse Association of America, held at Chicago, November 30, 1927, and during the time of the International Livestock Exposition, it was pointed out that the 1927 show was the strongest show of draft horses that had been seen since 1913. More and better horses were on exhibit than at any time in the past thirteen years, and breeders and dealers in draft horses showed every evidence of having been encouraged with the draft-horse situation.

Three main lines of work were pursued during the last year:

1. Big hitch demonstrations.
2. Work to increase the use of horses in cities.
3. Pulling contests.

THE BIG HITCH

Big-hitch demonstrations are foundation stones and are of fundamental importance for the reason that they teach farmers how to get good results

out of their teams. The men who learn to use their teams in large units reduce their production costs, increase their farm profits and become satisfied with horses and mules, with a consequent increased interest in the breeding of horses and in putting their equipment in first-class condition.

Farmers generally are more favorable to the use of horses and mules and in many sections are much interested in six- and eight-horse hitches. It is doubtful, however, if the big-team hitches are practicable on the small farms of the East where teamsters' interests are much diversified. They should be more valuable to the western farmer, where less diversified farming operations are conducted on a large scale on larger farms. It is apparent that more will be gained in the east by pulling contests which stimulate the pride of teamsters in individual teams.

CITY HORSES

Trained men have been working in Chicago and New York for two years determining operating costs of motor and horse delivery and encouraging the use of horses where more economical. Work of this character has been started in the Cleveland, Buffalo, Cincinnati and Pittsburgh districts; also in New England.

On long non-stop hauls, trucks have the advantage over horses; but, in short-haul, frequent-stop work, the horse is supreme, and wherever accurate costs are kept no other type of equipment can displace him.

Dairy companies are increasing horses both in New York and Chicago. Motorization is impracticable. Motor cars, either gas or electric, impose extra work on salesmen as they have to go back and move the vehicle from place to place, while the horse starts himself. Motors have proved to be unsatisfactory in the winter when deep snows prevail.

City buyers are of much greater importance to the horse and mule industry than the number of animals owned and used in cities would indicate, for they set the price for good horses and mules, which is reflected down on prices realized for all others.

PULLING CONTESTS

Pulling contests were featured in sixteen states, one Canadian province and one European country (Germany). Twenty-one dynamometers were in use in the sixteen states. A total of 210 pulling contests were given, with approximately 1800 teams pulling, and a total attendance of 691,250 persons.

The pulling contests encourage the breeding of massive, heavily muscled, powerful draft type of horses, with courage, strength and a fighting spirit. These contests have conclusively proved that horses of this type are superior to those lacking such qualities. Team-owners report that the most of their drivers have shown great interest in the pulling contests, and that participation therein has had a most beneficial influence upon their workmen in that every man takes better care of his horses and that there is improvement in the general morale of the whole force of teamsters, and a stimulation of pride in their teams.

The contests have also taught valuable lessons on collar-fitting, fitting of hames, proper adjustment of harness, and shoeing, all of which enter into the maximum effort draft horses or mules can exert.

PUBLICITY

From a publicity standpoint much cooperation has been given by newspapers and trade journals for Horse Association items. During the year, 75 radio addresses and much debate material were furnished, indicating that the relative merits of tractors and of horses and mules is a subject much to the front. Material has also been furnished for addresses to Rotary Clubs, harness dealers' conventions and many other gatherings.

HORSE POPULATION

On January 1, 1928, horses and colts on farms totalled 14,541,000, a decrease of 4 per cent over one year ago. They are now at the lowest point in forty years. Mules and mule colts aggregate 5,566,000, a decrease of 2 per cent. All cattle show a decrease of 2 per cent while sheep gained 6.5 per cent, hogs 8.4 per cent and dairy cattle 1 per cent.

PRICES

Prices show a slight gain, as the average price for all horses was advanced to \$67.07, or a gain of \$2.94. The average price of mules was \$79.60, or a gain of \$5.11. This average includes everything from weanling colts to animals forty years of age.

There now exists a serious shortage of good horses and mules of the proper types. The increased demand for such horses has caused a strengthening of prices. Good farm chunks and good draft or wagon horses and mules have been from \$15 to \$25 higher than a year ago and the demand has been good.

The range in price between good and poor horses is wider than ever before. In one locality small, unbroken horses could not be sold for \$10.00 per head; in another district, fair-sized unbroken two- and three-year-olds averaged \$27.50 per head, while a few miles away high-class, well-broken drafters sold for \$250.00 each. Good prices for horses of the proper types encourage farmers to breed more of these types. The average age of horses in the Northeast and Southeast has increased. Many horses are over ten years of age, yet the price per head has held up or is a little better.

BREEDING

The breeding situation is better than it has been for a number of years. More stallions have been sold and communities having good stallions or jacks available show a gain in mares covered. More mares are being bred in districts where stallions are traveled than in districts where necessary to take the mares to them.

The number of colts born in 1927, per 1,000 horses and mules on farms, exceeded slightly the number born in 1925 or 1926. The colts, however—42.4 per 1,000 horses and mules—do not equal the annual losses by death, which are estimated to be 66 per 1,000 head. There is no likelihood that the birth-rate will be higher than the death-rate until prices show a more substantial advance, thus the total number of horses and mules will continue to decline for a number of years.

Both Thoroughbred and harness racing have enjoyed an unusually satisfactory year. Keen interest has been shown in riding for pleasure, polo, hunting and the show ring.

A problem confronting the country owners of horses and somewhat difficult of solution is that of shoeing.

In conclusion your representative wishes to emphasize some of the activities of the Horse Association, as pointed out in last year's report.

1. It encourages the use of horses in all places where they can be most suitably or most economically used as motive power, for the reason that this furnishes a market for a certain percentage of farm crops, has a stable effect on farm markets and stimulates the breeding of horses.

2. It encourages the breeding of horses of certain types for which there is a demand, because horses of only such types can be profitably bred and reared.

3. It encourages pulling contests because they stimulate the breeding of horses with strength and endurance, and make for success of county and local fairs.

4. It encourages the breeding of light horses for racing and use under the saddle, because racing and riding for recreation, in the pursuit of health and pleasure, stimulate the breeding for speed and endurance.

5. It encourages the development of bridle-paths and riding-trails to keep pace with the rapid development of riding, for the reason that the motorized highways are unsuitable for this purpose.

6. It encourages the big-team hitch for the reason that big-team users are satisfied horsemen and successful farmers, and are considered better risks from the banker's standpoint. The big team will reduce production costs, add to yields through more timely planting, will encourage breeding and, through increased use of farm crops for horse feed, will help to make stable farm markets.

The Horse Association of America solicits and welcomes your future support. Its activities have been limited in the past, and will be limited in the future, by the funds available.

(Signed) H. R. CHURCH.

PRESIDENT HILTY: What shall be done with this report?

DR. WM. MOORE: I move the adoption of the report as read.

. . . The motion was regularly seconded, put to a vote and carried.

PRESIDENT HILTY: The next in order is the report of the representative to the American Association for the Advancement of Science. Dr. Ward Giltner.

. . . Dr. Giltner read his report. . . . (Applause)

REPORT OF A. V. M. A. REPRESENTATIVE TO THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

MR. PRESIDENT AND MEMBERS:

Your representative was appointed by President Hilty to succeed the late Dr. E. C. Schroeder. The appointment took effect since the last meeting of the A. A. A. S. The following letter from Doctor Schroeder's associate, Dr. W. E. Cotton, was received in reply to my inquiry as to whether Doctor Schroeder had left any memorandum or report as the representative of the A. V. M. A. to the A. A. A. S.:

"Some time ago I promised to look over Dr. Schroeder's papers to determine if there was anything among them that had to do with his work as delegate from the A. V. M. A. to the A. A. A. S., that would be of use to you as his successor or that might require your attention. There seems to be nothing of this kind among them. There are several form letters from the secretary of Section N of the A. A. A. S., together with copies of Dr. Schroeder's answers to them, but these concern suggestions for programs, nominations, etc., all of which are of the past.

"Dr. Schroeder attended only one meeting of the A. A. A. S., after he became delegate to it. This was the one at Philadelphia, the Nashville meeting coming about a month before his death. While at the Philadelphia meeting he was too sick to attend many of the sessions. He wrote a brief report for the A. V. M. A., which he had me present at the last meeting."

Your representative is duly conscious of the honor conferred upon him by the Association and is sincerely desirous of adequately representing American veterinary medicine in the councils of American science.

WARD GILTNER.

PRESIDENT HILTY: What is your pleasure with this report?

DR. WM. MOORE: I move the adoption of this report.

. . . The motion was regularly seconded, put to a vote and carried.

PRESIDENT HILTY: The next in order is the report of the Committee on Necrology, Dr. A. H. Baker, Chairman.

SECRETARY HOSKINS: As most of you know, Dr. Baker is not at this meeting. He had fully planned to be here; had reservations at this hotel, but two weeks ago Mrs. Baker fell and fractured a humerus. For that reason they had to give up their plans for attending this meeting. Dr. Baker forwarded the report to me and asked me to present it to you.

. . . Secretary Hoskins read the report. . . .

REPORT OF COMMITTEE ON NECROLOGY

MR. PRESIDENT AND MEMBERS:

The Committee on Necrology begs leave to report that during the year just closed, the Association lost one honorary member and thirty-seven active members by death. Appropriate obituaries have appeared in the JOURNAL from month to month.

The list follows:

HONORARY MEMBER

MEREDITH, HON. E. T., d. June 17, 1928, Des Moines, Iowa. B. Dec. 23, 1876. Highland Park College (Des Moines Univ.) A. V. M. A. (Hon.) 1920.

ACTIVE MEMBERS

- AMLING, HENRY, d. March 18, 1928, New York, N. Y. B. Apr. 12, 1865. New York C. V. S. 1893. A. V. M. A. 1913.
- ANDRESS, W. R., d. Apr. 19, 1928, Philadelphia, Pa. B. Dec. 4, 1878. Univ. of Pennsylvania 1900. A. V. M. A. 1918.
- BOYCE, NELSON V., d. Nov. 10, 1927, Kansas City, Kans. B. Oct. 29, 1857. Kansas City V. C. 1899. A. V. M. A. 1918.
- BOYD, JAMES, d. Oct. 29, 1927, Milpitas, Calif. B. May 15, 1855. San Francisco V. C. 1907. A. V. M. A. 1911.
- BURNETT, SAMUEL H., d. Apr. 30, 1928, Ithaca, N. Y. B. Nov. 18, 1869. New York S. V. C. 1902. A. V. M. A. 1905.
- CLARK, CLARENCE W., d. June 18, 1928, Ashland, Wis. Chicago V. C. 1910. A. V. M. A. 1912.
- CULLEN, J. T., d. Dec. 31, 1927, West Fargo, N. Dak. B. Feb. 12, 1884. Ohio S. U. 1910. A. V. M. A. 1925.
- DAVIS, B. C., d. Apr. 2, 1928, Carrollton, Mo. B. Feb. 9, 1876. Kansas City V. C. 1904. A. V. M. A. 1922.
- EBBITT, RICHARD, d. Mar. 23, 1928, Papillion, Nebr. Royal C. V. S. (Edinburgh) 1881. A. V. M. A. 1892.
- FINLEY, RUFUS W., d. May 20, 1928, Rockford, Ill. B. Feb. 3, 1863. Chicago V. C. 1891 (D. V. S.) and 1895 (M. D. C.). A. V. M. A. 1922.
- FLOWE, HOMER PATRICK, d. Aug. 17, 1927, Asheville, N. C. B. May 8, 1889. United States C. V. S. 1913. A. V. M. A. 1916.
- GLACKEN, E. L., d. Mar. 29, 1928, Erlanger, Ky. B. Jan. 2, 1867. Cincinnati V. C. 1913. A. V. M. A. 1917.
- GORE, TRUMAN E., d. June 18, 1928, Clarksburg, W. Va. B. Aug. 2, 1871. Ontario V. C. 1895. A. V. M. A. 1912.
- GRAPP, GUSTAV H., d. Mar. 31, 1928, Baltimore, Md. B. May 6, 1866. United States C. V. S. 1907. A. V. M. A. 1915.
- HANDLEY, JOHN ISAAC, d. July 23, 1928, Atlanta, Ga. Alabama P. I. 1913. A. V. M. A. 1913.
- HAY, LEOPOLD, d. Mar. 12, 1928, Faribault, Minn. B. 1873. Ontario V. C. 1896. A. V. M. A. 1910.
- JEFFERIS, LT. COL. JOSEPH R., d. Sept. 15, 1927, Indianapolis, Ind. B. Nov. 8, 1866, Univ. of Pennsylvania 1893. A. V. M. A. 1910.
- JUHL, PETER CHRISTOPHER, d. Apr. 18, 1928, Staten Island, N. Y. B. May 31, 1853. Royal C. V. S. (Copenhagen) 1875. A. V. M. A. 1927.
- KIERNAN, JOHN A., d. Dec. 13, 1927, Washington, D. C. B. July 27, 1873. New York C. V. S. 1894. A. V. M. A. 1908.
- LINDSEY, L. J., d. Feb. 18, 1928, Estherville, Iowa. B. 1885. Kansas City V. C. 1914. A. V. M. A. 1919.
- LOGAN, JAMES AUSTIN, d. Nov. 18, 1927, Colorado Springs, Colo. B. Sept. 14, 1887. Chicago V. C. 1910. A. V. M. A. 1912.
- MCCULLY, ROBERT W., d. May 8, 1928, New York, N. Y. B. Dec. 16, 1869. Ontario V. C. 1890. A. V. M. A. 1901.
- MATHEWS, E., d. Feb. 9, 1928, Morristown, N. J. B. 1860. New York C. V. S. 1894. A. V. M. A. 1901.
- MILLER, CHESTER, d. Feb. 4, 1928, Duluth, Minn. B. Feb. 27, 1872. Ontario V. C. 1893. A. V. M. A. 1898.
- MITCHELL, MAJOR AQUILA, d. Oct. 16, 1927, Ft. Oglethorpe, Ga. B. Apr. 29, 1870. American V. C. 1895. A. V. M. A. 1905.

- NICHOLAS, JOHN S., d. Mar. 21, 1928, Charlottesville, Va. B. Apr. 1, 1889. United States C. V. S. 1917. A. V. M. A. 1919.
- PUGH, WILLIAM T., d. Apr. 8, 1928, Southbridge, Mass. Ontario V. C. 1895. A. V. M. A. 1911.
- RAFTER, EDWARD, d. Mar. 22, 1928, Hamburg, N. Y. B. Aug. 31, 1872. Ontario V. C. 1895. A. V. M. A. 1911.
- RAMSEY, SAMUEL V., d. Mar. 10, 1928, Waycross, Ga. B. Feb. 9, 1860. Chicago V. C. 1889. A. V. M. A. 1909.
- ROWAT, ALLAN RITCHIE, d. Sept. 19, 1927, Honokaa, Hawaii. B. Nov. 1861. Montreal V. C. 1887 and McGill Univ. 1891. A. V. M. A. 1925.
- SCHROEDER, E. C., d. Jan. 24, 1928, Bethesda, Md. B. April 3, 1865. Harvard Univ. 1887. A. V. M. A. 1888.
- SIDENER, WARNER, d. June 12, 1928, Milford, Ill. B. Jan. 25, 1879. Indiana V. C. 1909. A. V. M. A. 1920.
- SHERMAN, W. A. d. — — — — —, Lowell, Mass. B. — — — — —. American V. C. 1881. A. V. M. A. 1882.
- SILFVER, OSCAR, d. Sept. 17, 1927, Peoria, Ill. B. Apr. 30, 1867. Chicago V. C. 1906. A. V. M. A. 1907.
- WHITNEY, HARRISON, d. Dec. 8, 1927, Portland, Me. B. 1859. Harvard Univ. 1887. A. V. M. A. 1888.
- WHITE, THOMAS, d. Feb. 10, 1928, Philadelphia, Pa. B. 1875. Univ. of Pennsylvania 1900. A. V. M. A. 1918.
- WILSON, HOWARD WESLEY, d. July 18, 1928, Helena, Ark. B. Mar. 17, 1891. Chicago V. C. 1915. A. V. M. A. 1918.

(Signed) A. H. BAKER, *Chairman*.
 (Signed) C. D. MCGILVRAY
 (Signed) WM. HENRY KELLY
 (Signed) JAS. T. GLENNON
 (Signed) PETER MALCOLM.

PRESIDENT HILTY: What is your pleasure with regard to this report?

DR. T. H. FERGUSON: I move it be adopted.

. . . The motion was regularly seconded, put to a vote and carried. . . .

PRESIDENT HILTY: In this connection, allow me to say that the application for membership in the A. V. M. A. from one of our members in Ohio, Dr. B. C. Eldredge, of Swanton, was in the Secretary's hands and four or five days after the receipt of the application he died from rabies.

The next in order is the report of the Committee on History, Dr. P. A. Fish, Chairman.

SECRETARY HOSKINS: Mr. President and Members: I had a letter from Dr. Fish, about a week ago, in which he asked me to present a report of progress for the Committee on History.

The work of that Committee is somewhat different from the work of any of our other committees and, as you know, consists of the compilation of a history of the veterinary profession in America. Dr. Fish and the members of his Committee have been able to make some progress during the year, but owing to the nature of it, there was really nothing to submit at this time in the form of a report.

PRESIDENT HILTY: The next in order is the report of the Committee on Legislation, Dr. J. P. Turner, Chairman.

SECRETARY HOSKINS: Mr. President and Members: This report was handed to me by Dr. C. J. Marshall, a member of the Committee, and he has asked me to read it.

Secretary Hoskins read the report.

REPORT OF COMMITTEE ON LEGISLATION

During the past year your Committee has concentrated its efforts on increasing the salaries of the field veterinarians employed by the federal Bureau of Animal Industry, who were the poorest paid professional men in the service of the United States. For this purpose the Association has allotted appropriations amounting to \$4,500.

Early in the year your Committee made a contact with a similar committee of the Association of Bureau of Animal Industry Veterinarians. Through the efforts of its able counsel, Mr. Geo. P. McCabe, the Appropriations Committee of the House of Representatives gave a hearing lasting nearly three hours to your Committee and that of the Bureau veterinarians. The necessity for making a more liberal appropriation for field veterinarians was brought out very forcibly by the remarks of the members of both committees.

Your Committee was given the able assistance of our President, Dr. Hilty, who made a splendid and convincing address, interspersed with a few very apt stories, which secured the close attention of the House Committee, and was largely responsible for our success.

Dr. C. A. Cary, a past president of this Association, presented some telling arguments to this Committee and did not mince his words—telling the members how veterinary matters in general were greatly discouraged by the poor salaries paid federal veterinarians.

The result of this and other hearings was that the House Committee recommended an increase of \$39,300 over the Budget estimate of \$120,620, and this recommendation was sustained by the House. Later on, the Senate added \$39,760 for promotions, making a total of \$199,680. This increase, together with the share in the advances in salaries made possible by the Welsh Bill, will give much needed relief to these veterinarians.

Your Committee in this report desires to express its gratification for the many suggestions, cooperation, and telling efforts put forth in securing this legislation by Dr. John R. Mohler, Chief of the U. S. Bureau of Animal Industry.

Your Committee believes that this is the greatest victory won by our profession since the Army Veterinary Corps was established and that this increase in salaries paid federal veterinarians will reflect itself throughout the country and assist other poorly paid veterinarians in the public service of the states, counties and municipalities in securing proper compensation.

This federal increase raises the "hump" in the salary list from \$2,400 to \$2,800. Over 700 of the 1,300 veterinarians employed by the Bureau of Animal Industry will now receive \$2,800 a year, while the maximum salary now allowed a veterinarian in the field has been increased to \$5,800. This should stimulate veterinary matriculations in our colleges and give needed encouragement throughout the profession.

Late in the session of Congress, an attempt was made by the U. S. Treasury to raise the narcotic tax, paid by veterinarians, physicians, and dentists, from \$1 to \$3 a year. This recommendation of the Treasury passed the Senate Finance Committee before anybody was aware of its existence. We sent out a call to many in the profession and, aided by similar efforts made by the medical and dental professions, defeated this measure before both houses of Congress.

An item in the Appropriations Bill which we were unable to defeat was that which will not permit veterinarians to deduct from their returns on

income tax, the money paid in attending veterinary conventions. While tradesmen are allowed this privilege in this law, it was denied professionals.

(Signed) J. P. TURNER, *Chairman*

(Signed) C. J. Marshall

(Signed) J. L. Axby

(Signed) F. E. MURRAY

W. H. WELCH.

DR. WM. MOORE: I move the adoption of this report.

. . . The motion was regularly seconded, put to a vote and carried.

PRESIDENT HILTY: The next is the report of the Committee on Intelligence and Education, Dr. D. H. Udall, Chairman.

SECRETARY HOSKINS: Mr. President and Members: This is only a preliminary report of the Committee on Intelligence and Education. The Committee asks the privilege of being allowed to present the full report later. This is part one and contains three nominations for honorary membership, which, according to the By-Laws, must lie on the table for twenty-four hours before being acted upon finally.

. . . Secretary Hoskins read part one of the report. . . .

(See full report, page 779)

PRESIDENT HILTY: Since this report must lie on the table for twenty-four hours, no action is to be taken at this time.

The next in order is the report of the Committee on Veterinary Biologies, Dr. F. A. Imler, Chairman.

. . . Dr. Imler read the report. . . .

REPORT OF COMMITTEE ON VETERINARY BIOLOGICS

MR. PRESIDENT AND MEMBERS:

The magnitude of the task of classifying veterinary biologies, according to their value or efficiency, now before the Committee on Veterinary Biologies, makes it impossible of completion within the life of any one committee. The present tenure of office of the members of the Committee on Veterinary Biologies is from the date of their appointment until the next regular meeting of this Association. It will be seen, therefore, that the changing of the entire personnel of the Committee, or a majority of it each year, would be a great handicap to the completion of this task. The last two presidents of the Association apparently have recognized this situation and have seen fit to reappoint a majority of the Committee. This has been most fortunate and in a large measure is responsible for the progress which the Committee has made.

The specifications for the personnel of the Committee on Veterinary Biologies are now provided for and appear satisfactory to all concerned. In order to insure greater permanence to the personnel of the Committee, however, it is recommended that the Association take the necessary steps to provide for the appointment of its members along the same lines as those now provided for the Committee on Intelligence and Education and the Committee on Legislation.

The Committee on Veterinary Biologies, in common with several other committees of the Association, is obliged to conduct much of its work by correspondence. In view of the character of the major task before the Committee and of the several interests represented on the Committee, it is highly

desirable to hold at least one meeting of the full membership in advance of the regular meeting of this Association. Since the advantages to be derived from such a meeting will accrue to the benefit of this Association, it seems proper and the Committee recommends, that the funds allotted to it be sufficient to permit of the reimbursement of the expenses incurred by the several members of the Committee in attending such a meeting.

Despite the handicaps referred to above, the Committee has continued the task of classifying veterinary biologics and reports the following progress:

It has made a survey of the biologics now available for use in the practice of veterinary medicine and for which a U. S. Veterinary License is in force, as of July 1, 1928, and finds that there are 71 different veterinary biologics and that these are marketed under 267 different names. In many instances practically the same biologic is marketed under several different names. Preparatory to classifying these biologics, the Committee has grouped them according to source, methods of preparation, etc., into five general classes, as follows: (1) Aggressins; (2) Antisera and Sera; (3) Bacterins; (4) Diagnostic Agents and (5) Vaccines and Viruses.

A list of the biologics, together with the name or names under which each is marketed, which the Committee has grouped under the five general classes referred to above, follows:

1. Aggressins

<i>Name of Product</i>	<i>Name or Names under which Marketed</i>
1. Anthrax Aggressin	Anthrax Aggressin
2. Blackleg Aggressin (Natural)	Blackleg Aggressin
3. Blackleg Aggressin (Cultural)	Blackleg Filtrate
4. Hemorrhagic Septicemia Aggressin	Hemorrhagic Septicemia Aggressin
	Hemorrhagic Septicemia Aggressin (Bovine)
	Hemorrhagic Septicemia Aggressin (Equine)

2. Antisera and Sera

1. Abortion Antiserum (Bovine)	Anti-Abortion Serum (Bovine)
	Antibovine Abortion Serum
2. Abortion Antiserum (Equine)	Anti-Equine Abortion Serum
3. Anthrax Antiserum	Anti-Anthrax Serum
4. Blackleg Antiserum	Anti-Blackleg Serum
5. Botulinus Antiserum	Botulinus Antitoxin
	Botulinus Antitoxin (Polyvalent)
6. Distemper Antiserum (Canine)	Anti-Canine Distemper Serum
	Anti-Canine Distemper Serum (Homologous)
	Anti-Canine Distemper Serum (Polyvalent)
	Anti-Distemper Serum (Canine)
	Canine Anti-Distemper Serum
7. Hemorrhagic Septicemia Antiserum	Anti-Hemorrhagic Septicemia Serum
	Anti-Hemorrhagic Septicemia Serum (Bovine)
	Anti-Hemorrhagic Septicemia Serum (Equine)
	Anti-Hemorrhagic Septicemia Serum (Ovine)
	Anti-Hemorrhagic Septicemia Serum (Porcine)
	Anti-Hemorrhagic Septicemia Serum (Swine)
	Anti-Hemorrhagic Septicemia Serum (For Cattle)

<i>Name of Product</i>	<i>Name or Names under which Marketed</i>
	Anti-Hemorrhagic Septicemia Serum (For Sheep)
	Anti-Hemorrhagic Septicemia Serum (For Swine)
8. Hog Cholera Antiserum	Anti-Hog Cholera Serum
9. Influenza Antiserum (Equine)	Anti-Distemper and Anti-Influenza Serum (Equine)
	Anti-Equine Influenza Serum
	Anti-Influenza Serum (Equine)
10. Mastitis Antiserum (Bovine)	Anti-Mammitis Serum (Bovine)
	Anti-Mastitis Serum (Bovine)
11. Mixed Antiserum (Avian)	Anti-Mixed Infection Serum (Avian)
12. Mixed Antiserum (Porcine)	Anti-Mixed Infection Serum (swine)
	Anti-Mixed Infection Serum (For Swine)
13. Navel-Ill Antiserum (Equine)	Anti-Navel-Ill Serum (Equine)
14. Pyogenes Bacillus Antiserum (Bovine)	Anti-Pyogenes Bacillus Serum (Bovine)
15. Scours Antiserum (Bovine)	Anti-Calf Scour Serum
	Anti-White Scour Serum (Bovine)
16. Scours Antiserum (Porcine)	Anti-Enteritis Serum (Swine)
	Anti-Pig Dysentery Serum
	Anti-Pig Scour Serum
17. Streptococcus Antiserum (Equine)	Antistreptococcic Serum (Equine)
18. Tetanus Antiserum	Tetanus Antitoxin,
19. Normal Serum (Equine)	Normal Horse Serum
20. Normal Serum (Bovine)	Normal Bovine Serum
21. Venom Anti-Serum	Antivenin

3. Bacterins

1. Abortion Bacterin (Bovine)	Abortion Bacterin (Bovine)
	Abortion Bacterin Mixed (Bovine)
	Abortion Mixed Bacterin
	Abortion Mixed Bacterin (Bovine)
	Anti-Abortion Bacterin (Bovine)
	Bacillus Abortus Bacterin (Bovine)
	Bovine Abortion Bacterin
	Bovine Abortion Bacterin (Mixed)
	Bovine Abortion Mixed Bacterin
	Bovine Abortion Serobacterin
	Mixed Abortion Bacterin (Bovine)
2. Abortion Bacterin (Equine)	Abortion Bacterin (Equine)
	Abortion Mixed Bacterin (Equine)
	Equine Abortion Bacterin
	Equine Abortion Bacterin (Mixed)
	Equine Abortion Mixed Bacterin
	Equine Abortion Serobacterin (Mixed)
3. Abortion Bacterin (Porcine)	Abortion Mixed Bacterin (Swine)
	Swine Abortion Bacterin (Mixed)
	Swine Abortion Mixed Bacterin
4. Autogenous Bacterin	Autogenic Bacterin
	Autogenous Bacterin
	Autogenous Vaccine
5. Blackleg Bacterin	Blackleg Bacterin

<i>Name of Product</i>	<i>Name or Names under which Marketed</i>
6. Colon Bacterin	Coli Bacterin (Bovine) Colon Bacterin (Bovine) Colon Bacterin (Equine) Colon Vaccine (Equine)
7. Distemper Bacterin (Canine)	Bacillus Bronchisepticum Bacterin (Canine) Canine Distemper Bacterin Canine Distemper Mixed Bacterin Canine Distemper Mixed Vaccine Canine Distemper Serobacterin Canine Distemper Serobacterin (Mixed) Canine Distemper Vaccine Distemper Mixed Bacterin (Canine)
8. Distemper Bacterin (Equine)	Distemper Mixed Bacterin (For Horses) Mixed Distemper Bacterin (Equine)
9. Distemper Bacterin (Feline)	Feline Distemper Bacterin
10. Hemorrhagic Septicemia Bacterin	Bacillus Avisepticus Bacterin Bacillus Suisepcticus Bacterin Fowl Cholera Bacterin Hemorrhagic Septicemia Bacterin Hemorrhagic Septicemia Bacterin (Avian) Hemorrhagic Septicemia Bacterin (Bovine) Hemorrhagic Septicemia Bacterin (Cattle) Hemorrhagic Septicemia Bacterin (Cuniculi) Hemorrhagic Septicemia Bacterin (Equine) Hemorrhagic Septicemia Bacterin (For Fowls) Hemorrhagic Septicemia Bacterin (For Sheep) Hemorrhagic Septicemia Bacterin (Ovine) Hemorrhagic Septicemia Bacterin (Porcine) Hemorrhagic Septicemia Bacterin (Rabbits) Hemorrhagic Septicemia Bacterin (Sheep) Hemorrhagic Septicemia Bacterin (Swine) Hemorrhagic Septicemia Combined Bacterin (Avian) Hemorrhagic Septicemia Combined Bacterin (Bovine) Hemorrhagic Septicemia Combined Bacterin (Equine) Hemorrhagic Septicemia Combined Bacterin (Ovine) Hemorrhagic Septicemia Combined Vaccine (Bovine) Hemorrhagic Septicemia Combined Vaccine (Sheep) Hemorrhagic Septicemia Combined Vaccine (Swine)

<i>Name of Product</i>	<i>Name or Names under which Marketed</i>
	Hemorrhagic Septicemia Combined Vaccine (For Cattle)
	Hemorrhagic Septicemia Combined Vaccine (For Sheep)
	Hemorrhagic Septicemia Combined Vaccine (For Swine)
	Hemorrhagic Septicemia Mixed Bacterine (Bovine)
	Hemorrhagic Septicemia Sero vaccine (Bovine)
	Hemorrhagic Septicemia Vaccine (Avian)
	Hemorrhagic Septicemia Vaccine (For Fowls)
	Swine Hemorrhagic Septicemia Bacterin
	Swine Plague Bacterin
11. Influenza Bacterin (Equine)	Anti-Equine Influenza Bacterin (Mixed)
	Anti-Influenza Bacterin (Equine)
	Anti-Influenza Mixed Bacterin (Equine)
	Equine Influenza Bacterin
	Equine Influenza Bacterin (Mixed)
	Equine Influenza Mixed Bacterin
	Equine Influenza Mixed Vaccine
	Equine Influenza Serobacterin (Mixed)
	Influenza Bacterin (Equine)
	Influenza Mixed Bacterin (Equine)
12. Keratitis Bacterin (Bovine)	Keratitis Mixed Bacterin
	Keratitis Mixed Bacterin (Bovine)
13. Mastitis Bacterin (Bovine)	Bovine Mastitis Mixed Bacterin
	Bovine Mastitis Streptococcus Bacterin
	Mammitis Mixed Bacterin (Bovine)
	Mastitis Bacterin (Bovine)
	Mastitis Bacterin Mixed (For Cattle)
	Mastitis Mixed Bacterin (Bovine)
	Mastitis Mixed Vaccine (For Cattle)
	Mastitis Mixed Vaccine (Bovine)
	Streptococcus Mastitis Bacterin (Bovine)
14. Metritis Bacterin* (Bovine)	Metritis Mixed Bacterin (Bovine)
	Metritis Mixed Bacterin (For Cattle)
15. Metritis Bacterin (Equine)	Equine Metritis Mixed Bacterin
16. Mixed Bacterin (Avian)	Avian Mixed Bacterin
	Avian Mixed Infection Bacterin
	Avisepticus-Sanguinarium Bacterin
	Fowl Cholera and Typhoid Mixed Bacterin
	Mixed Bacterin (Avian)
	Mixed Bacterin (For Fowls)
	Mixed Bacterial Vaccine (For Fowls)
	Mixed Infection Bacterin (Avian)
	Mixed Infection Bacterin (For Fowls)
	Polyvalent Bacterin Mixed (Avian)
	Roup Bacterin

<i>Name of Product</i>	<i>Name or Names under which Marketed</i>	
17. Mixed Bacterin (Bovine)	Bovine Mixed Bacterin	24.
	Bovine Mixed Infection Bacterin	
	Mixed Bacterin (Bovine)	25.
	Mixed Bacterial Vaccine (Bovine)	
	Mixed Infection Bacterin (Bovine)	26.
	Mixed Infection Bacterin (For Cattle)	
	Polyvalent Bacterin Mixed (Bovine)	
	Strep-Staph-Coli Bacterin (For Cattle)	
18. Mixed Bacterin (Canine)	Canine Mixed Infection Bacterin	27.
	Canine Staph-Strep Bacterin	
	Mixed Bacterin (Canine)	
	Mixed Infection Bacterin (Canine)	
	Polyvalent Bacterin Mixed (Canine)	
	Polyvalent Mixed Bacterin (Canine)	
	Staph-Strep Bacterin (Canine)	
	Staphylococcus-Streptococcus Bacterin (Canine)	
	Strepto-Staphylo Bacterin (Canine)	
19. Mixed Bacterin (Equine)	Equine Mixed Polyvalent Bacterin	
	Mixed Bacterin (Equine)	
	Mixed Bacterial Vaccine (Equine)	
	Mixed Infection Phylacogen (Equine)	28.
	Polyvalent Mixed Bacterin (Equine)	
	Polyvalent Bacterin Mixed (Equine)	29.
	Strep-Staph-Coli Bacterin (For Horses)	
	Streptococcus-Staphylococcus Bacterin (Equine)	
	Strepto-Staphylo Bacterin (Equine)	
20. Mixed Bacterin (Lepine)	Mixed Bacterin (Cuniculine)	30.
	Mixed Bacterin (For Rabbits)	
	Mixed Bacterin (Rabbits)	
	Mixed Infection Bacterin (For Rabbits)	
	Mixed Infection Bacterin (Lepine)	
	Polyvalent Bacterin Mixed (Rabbits)	
21. Mixed Bacterin (Ovine)	Mixed Bacterin (Ovine)	
	Mixed Bacterin (Sheep)	
	Mixed Infection Bacterin (For Sheep)	
	Mixed Infection Bacterin (Ovine)	31.
	Ovine Mixed Bacterin	
22. Mixed Bacterin (Porcine)	Mixed Bacterin (Porcine)	
	Mixed Bacterin (For Swine)	
	Mixed Bacterin (Swine)	
	Mixed Bacterial Vaccine (For Swine)	32.
	Mixed Infection Bacterin (For Swine)	
	Mixed Infection Bacterin (Swine)	
	Polyvalent Bacterin Mixed (Swine)	
	Polyvalent Mixed Bacterin (Swine)	
	Swine Mixed Bacterin	
	Swine Mixed Infection Bacterin	
23. Navel-Ill Bacterin (Equine)	Equine Navel-Ill Mixed Bacterin	
	Equine Navel-Ill Serobacterin (Mixed)	
	Joint-Ill Mixed Bacterin (Equine)	
	Navel-Ill Bacterin (Equine)	
	Navel-Ill Bacterin Mixed (For Colts)	
	Navel Infection Mixed Bacterin (Equine)	
	Pyæmic-arthritis Mixed Bacterin (Equine)	

<i>Name of Product</i>	<i>Name or Names under which Marketed</i>
24. Pneumonia Bacterin (Equine)	Pneumonia Mixed Bacterin (Equine) Pneumonia Phylacogen (Equine)
25. Rhinitis Bacterin (Porcine)	Infectious Rhinitis Mixed Bacterin (Swine)
26. Scours Bacterin (Avian)	Fowl Typhoid Bacterin Fowl Typhoid Mixed Bacterin White Diarrhea Mixed Bacterin (Avian)
27. Scours Bacterin (Bovine)	Anti-White Scours Mixed Bacterin (Bovine) Calf Scour Bacterin (Mixed) Calf Scour Mixed Bacterin White Scour Bacterin White Scour Bacterin (Bovine) White Scours Bacterin (Bovine) White Scour Mixed Bacterin (Bovine) White Scours Mixed Bacterin (Bovine) White Scour Sero-Bacterin Mixed (Bovine) White Scours Vaccine Mixed (For Calves)
28. Scours Bacterin (Equine)	Gastro-Enteritis Mixed Bacterin (Equine)
29. Scours Bacterin (Porcine)	Enteritis Bacterin (Swine) Enteritis Mixed Bacterin (Swine) Pig Dysentery Bacterin (Mixed) Pig Scour Bacterin Pig Scour Mixed Bacterin White Scour Bacterin (Swine)
30. Staphylococcus Bacterin	Canine Staphylococcus Bacterin Staphylo-Bacterin (Canine) Staphylo-Bacterin (Equine) Staphylococci Bacterin (Goats) Staphylococcus Bacterin (Canine) Staphylococcus Combined Bacterin (Canine) Staphylococcus Combined Vaccine (Equine)
31. Streptococcus Bacterin	Strepto-Bacterin (Equine) Streptococci Bacterin (Equine) Streptococcus Bacterin (Equine) Streptococcus Combined Bacterin (Equine)
32. Pyogenes Bacillus Bacterin (Bovine)	Pyogenes Bacillus Sero-Bacterin (Bovine)

4. Diagnostic Agents

1. Johnin	Johnin
2. Mallein	Mallein
3. Pullorin	Pullorin
4. Tuberculin (Avian)	Avian Tuberculin Tuberculin (Avian)
5. Tuberculin	Tuberculin

5. Vaccines and Viruses

1. Abortion Vaccine (Bovine)	Abortion Vaccine (Bovine) Bacillus Abortus Vaccine (Bovine) Bovine Abortion Serovaccine Bovine Abortion Vaccine
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<i>Name of Product</i>	<i>Name or Names under which Marketed</i>
2. Anthrax Vaccine	Anthrax Spore Vaccine Anthrax Vaccine
3. Blackleg Vaccine	Blackleg Vaccine
4. Canine Distemper Antigen	Canine Distemper Antigen Canine Distemper Mixed Antigen
5. Chicken Pox Vaccine	Chicken Pox Vaccine
6. Chicken Pox Virus	Chicken Pox Virus
7. Hemorrhagic Septicemia Vaccine	Hemorrhagic Septicemia Vaccine Hemorrhagic Septicemia Vaccine (For Cattle) Hemorrhagic Septicemia Vaccine (For Sheep) Hemorrhagic Septicemia Vaccine (For Swine)
8. Hog Cholera Virus	Hog Cholera Virus
9. Rabies Vaccine	Canine Rabies Vaccine Rabies Vaccine

In compliance with Section 4, of the regulations adopted for classifying veterinary biologics, the Committee reports that since the last annual meeting of the Association the following veterinary biologics have been classified in Group A (those products possessing value): anti-anthrax serum; anti-venin; normal serum (bovine); normal serum (equine); autogenous bacterin; tuberculin; tuberculin (avian); mallein; anthrax vaccine.

The following biologic has been placed in Group B (those products whose use or manufacture is in the experimental stage): pullorin.

The Committee recommends that the name under which each product is classified be accepted as the official name under which it should be marketed.

(Signed) F. A. IMLER, *Chairman.*

(Signed)

E. R. STEEL

(Signed)

F. A. ZIMMER

(Signed)

H. J. SHORE

F. S. JONES.

PRESIDENT HILTY: What is your pleasure with this report?

DR. IMLER: I move that the report be accepted and printed as part of the proceedings.

. . . The motion was regularly seconded, put to a vote and carried. . . .

PRESIDENT HILTY: The next in order is the report of the Committee on Schmidt Memorial. Dr. W. J. Embree.

SECRETARY HOSKINS: This report was handed to me by Dr. Embree, chairman of the Committee, at noon. Dr. Embree had expected to be here to read it, but had to leave.

. . . Secretary Hoskins read the report. . . .

REPORT OF COMMITTEE ON SCHMIDT MEMORIAL

MR. PRESIDENT AND MEMBERS:

The Special Committee on Schmidt Memorial desires to report that the entire amount of the fund (\$1,015.07) has been turned over to Dr. H. Jensen, a member of the Committee, who was appointed by President Hilty to attend the unveiling of the memorial. The attached letter from Dr. Jensen indicates that the work has been completed with the unveiling of the memorial. There-

fore, believing that our duties have been performed, we recommend the discharge of the Committee.

(Signed) W. J. EMBREE, *Chairman.*
O. V. BRUMLEY
E. S. DEUBLER
H. J. STAFSETH
H. JENSEN.

SECRETARY HOSKINS: The letter referred to in this report is one Dr. H. Jensen wrote to me from Copenhagen, under date of July 16, 1928.

Secretary Hoskins read the letter. . . .

Copenhagen, Denmark, July 16-28,

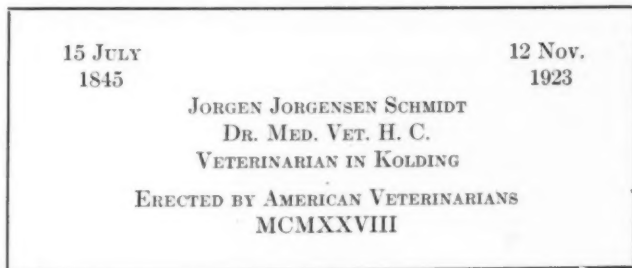
Dr. H. Preston Hoskins,
Detroit, Michigan.

DEAR DOCTOR HOSKINS:

The unveiling of the Schmidt Memorial took place immediately after my arrival on July 3d, at 2 p. m. It was my intention to spend a week or two in Norway prior to going to Copenhagen, but upon my arrival in Norway, I received a letter from Prof. Bang, requesting me to come to Copenhagen at once, as the Memorial was ready and he was very anxious to have the unveiling take place before the members of the faculty went away on their summer vacations.

The memorial is placed on the wall at the entrance to the building devoted entirely to pathological anatomy (generally conceded to be the most magnificent of its kind in the world), and consists of a sandstone slab, approximately 3 feet, 6 inches by 7 feet. In this is carved a niche, in which is placed a bronze bust of Dr. Schmidt. On the upper part of the slab is placed a bronze garland.

The inscription reads as follows:



The unveiling ceremony was attended by Dr. Schmidt's widow, her two daughters, son-in-law and several grandchildren. The Director, Prof. Ellinger, opened the ceremonies with a few words of appreciation and then introduced, as the speaker of the day, Prof. Bernhard Bang, who spoke at length on the good work done by Dr. Schmidt, who, over forty years ago, worked incessantly to bring about ways and means to suppress and control bovine tuberculosis, and made for himself an honored name at home. It was his work with parturient paresis, however, that won him world-wide fame, as he enabled the veterinarians the world over to treat successfully a condition that heretofore in most cases proved fatal.

Prof. Bang then unveiled the memorial and Prof. Ellinger, on behalf of the High School, accepted the same, emphasizing the unusual honor bestowed on Dr. Schmidt, whose life work had not been connected with the school, but who now had a memorial placed there. However, he had done something that had given him a world-wide name, and he had always felt himself very closely connected with the school and was one of its most distinguished students.

I was called to the rostrum and briefly related the history of milk fever in the United States, the great anxiety the practitioner of thirty years ago felt when he was called to treat a case of that kind, as the recoveries were so few that we only with great reluctance attempted any treatment, but, after the Schmidt treatment became known, it was a pleasure, as we obtained positive results. I claimed that the United States had received greater benefit from Dr. Schmidt's work than any other nation, as we undoubtedly were the largest cattle-raising country in the world.

On behalf of American veterinarians, I presented the memorial with the hope that it would stimulate the many students who daily pass the same to solve some of the many and weighty problems yet to be solved. I then placed a laurel wreath at the foot of the memorial, to which the American colors were attached.

Dr. Gautier, Chief Veterinarian and president of the Danish Veterinary Society, spoke briefly and also placed a wreath of flowers. The son-in-law of Dr. Schmidt arose, and on behalf of the family thanked the American veterinarians.

I am sending you some clippings. You will undoubtedly find someone in Detroit to help you read them.

Dr. Graham will send you a cut shortly. Please excuse the many errors. Have even misplaced my eraser. I shall not tarry here long. After a brief business trip to Germany, I will be on my way home.

Greetings.

(Signed) JENSEN.

PRESIDENT HILTY: What is your pleasure with this report?

DR. JOHN PATTERSON: I move that it be adopted and the Committee discharged.

. . . The motion was seconded, put to a vote and carried. . . .

PRESIDENT HILTY: We have one more report, that of the Committee on Transmissible Diseases of Animals, Dr. W. W. Dimock, Chairman.

DR. DIMOCK: This is the report of the Committee on Prevention of Transmissible Diseases of Animals. All members of the Committee have seen this report, and those who are not here have given me authority to sign their names to it.

In addition to the main part of the report, which the Chairman prepared, there are three separate parts: rabies and distemper in dogs, one on transmissible diseases in swine, and a statement by Dr. Hall on parasites. They will be read as parts of the report.

It was very gratifying to me as chairman of this Committee to hear Dr. Hilty, in his presidential address, say something about preventive medicine. Those of you who were in the Section on Sanitary Science and Food Hygiene and heard Dr. Giltner's paper on abortion know some of the things he said about the prevention and control of abortion disease. That was also very gratifying to me.

. . . Dr. Dimock then read the report. . . . (Applause)

REPORT OF COMMITTEE ON PREVENTION OF TRANSMISSIBLE DISEASES OF ANIMALS

Within the veterinary profession is found the group of trained scientists to whom the problems of diseases of animals have been assigned. The liberal appropriation of federal and state funds for educational purposes, for investigation, for research and for the support of control and regulatory agencies, and our state laws governing the practice of veterinary medicine are ample proof that official recognition is given to our work and that we are engaged with problems that are of general public interest and welfare. This official recognition carries with it a corresponding responsibility.

The American Veterinary Medical Association meets annually, that members of the profession may discuss together through the various sections the advancement of science along particular lines or a group of related lines. Contributions to these discussions come from those engaged in educational work, in research work, in control work, and in private practice.

Today diseases are dealt with through treatment, control, prevention and eradication. The trend is toward prevention, eradication and disease-free herds. Before we can proceed intelligently, reliable and definite information must be carefully worked out and agencies perfected. To this end educators and research workers contribute information as to the cause and nature of the disease and the methods of attack, leaving the field then to the control forces and the practitioner. It then becomes their problem to execute the plan. This is possible only with the willing and intelligent cooperation of the live stock owner, unless legal measures are resorted to.

Until recently the practitioner had for his primary object the cure of an individual patient. Now, if he is a man of imagination and vision, he works for the prevention of the disease and its eventual eradication.

The thing of today for the practitioner is preventive medicine. The practitioner who is not able to visualize the possibilities of preventive medicine in its full scope and who does not make the effort to place himself in possession of all the information, in general and in particular, necessary to practice preventive medicine effectively, has a future of limited usefulness so far as transmissible diseases are concerned.

Dr. Cole, of the Rockefeller Institute, recently made this statement in connection with diseases of man: "That all infectious diseases can be prevented or eradicated is not beyond the bounds of possibility." The same statement can be made for infectious and transmissible diseases of animals. We have many examples in this and other countries that go a long way in proving this assertion. In every instance where the prevention and eradication of a disease has been undertaken on a sound and fundamental basis and intelligently and consistently followed, our ability to cope with these problems has been more firmly established.

We have only to think of the work that has been done in the eradication of contagious pleuro-pneumonia, foot-and-mouth disease, glanders, dourine and fowl pest, and what is being done in the cases of tuberculosis, Texas fever, anthrax and blackleg, and what we might be able to accomplish, were the proper effort made, in the case of rabies, hog cholera, abortion disease, bacillary white diarrhea and parasitisms. Our failure to prevent the latter diseases more effectively is not due to the fact that it is not possible to prevent them but to the seemingly unwarrantable and inexcusable neglect we sometimes observe, on the part of all concerned, to make use of known steps and agents now available for the prevention and final eradication of this particular list of diseases.

Failure on the part of the profession, as a whole, to take a definite stand on methods of prevention for certain diseases demanding attention is due largely to the fact that we have been without sufficient definite knowledge of their causes and character to enable us to know how best to combat them effectively. Coming under this head are two diseases that today stand out as a challenge to our best efforts: abortion disease in cattle and bacillary white diarrhea in poultry. We should no longer hesitate to attack abortion and white diarrhea; reliable methods of procedure are now known and, if con-

sistently followed, will result in success. Methods of diagnosis and general plans essential for prevention and eradication are such as to warrant their general adoption for every herd and flock in the country, where circumstances indicate their use. We may not have the last word in methods of dealing with these two diseases, for their very nature excludes almost altogether the possibility of a plan or method that will in every detail prove to be perfect. However, no further delay should be tolerated just because our method of attack lacks perfection and is surrounded with difficulties. It is not essential that we know all there is to learn about a disease in order to be able to make preventive measures effective.

Of all the transmissible diseases to be dealt with, abortion in cattle and bacillary white diarrhea in poultry are in every respect most suitable for the inauguration of preventive measures as applied to the individual herd and flock. Any attempt to deal with these two diseases that does not use the herd or flock as a unit or basis of operation will result in failure. It should be remembered that for the control, prevention and eradication of transmissible diseases there are certain general fundamental principles and certain specific details that are applicable for all diseases and under all conditions. In applying these fundamental principles to the different diseases it is only necessary to modify the method of application and make use of such specific details as fit the characteristics of the particular disease with which we are working and the conditions under which the work must be carried out.

Our national laws and most of our state laws, as they have to do with the prevention of transmissible diseases, are as nearly sound as it is possible to write them at the present time. Our enforcement agencies are directed by men of unquestioned sincerity. Yet there are many very serious disease problems on which little or no progress is being made in control and prevention.

The interstate movement of live stock has long since become a permanent factor in our animal industry, and on the whole is exceptionally well supervised; the interchange of animals within the state and within the community is often not well regulated. This intrastate traffic in animals, conducted largely by the local live stock trader, offers in our opinion a serious problem in disease prevention and one for which I have no definite suggestions to offer as a means of correcting. As good as many of our state laws are, it has never been possible to deal effectively with this particular phase of the problem.

In those instances where we have prevented and eradicated disease beyond the expectations of the most optimistic, it has been accomplished largely through official action by federal and state agencies and the enforcement of rigid quarantine laws. This method of prevention is applicable and fully justifiable in the case of emergencies and for particular diseases; but it is not a method that can be practiced year in and year out for all the diseases with which we must contend. Therefore, it seems that if the veterinary profession of this country and the associated agencies are to carry out the work for which they exist and fulfill the mission that awaits them, each individual veterinarian must give more attention to the problem of preventive medicine.

We would not say that we are doing too much through our state and federal agencies or in a national way, but we do feel that there is so much merit in the individual disease-free herd or flock that we cannot afford to neglect what we might call the unit plan for disease prevention and eradication. We are thinking of the disease-free herd built up by the owner and his veterinarian and by them alone.

It seems that it has been demonstrated beyond question that the prevention and eradication of disease, in those instances where undertaken by state and federal agencies, has been on the whole a success; also, that the regulatory measures regarding the movement of animals as promulgated and now in force by the respective states and our federal government are all that is necessary and that their effectiveness is all that can be expected, especially for those diseases for which there are specific regulations. We need, therefore, give no further consideration at this time to disease prevention as carried out by that method.

The problem of disease prevention in connection with the local traffic in animals and for the live stock owner, whose major business is buying and selling, is one for which we have been unable to find a solution that was satisfactory to all concerned. There are in Kentucky, as in every state, many persons who in one way or another are making a living from the purchase and sale of live stock. The sole object is a rapid turnover, with as great a margin as possible. As necessary and legitimate as channels of trade may be, we cannot overlook in any disease-prevention program the opportunity for spread of disease through these channels. The class of men engaged in this particular phase of the live stock industry has been found to be most difficult to deal with. When in trouble they demand the best service that the veterinary profession has to offer and make every effort possible on their part to get out of the immediate difficulty. On the other hand, as a class, they are reluctant to accept advice in advance and abide by regulations of any form that have to do with the supervision of their activities and the inspection of live stock passing through their hands.

We are not directly interested in disease prevention for the local live stock trading center or those engaged in trade as such, except in its connection with the dissemination of transmissible diseases to the permanent herds and flocks of the community. We are particularly interested in disease prevention in the permanent herd or flock that is maintained for breeding purposes and we believe that the veterinary profession, particularly the practitioner, can perform a wonderful service in the control and prevention of transmissible diseases by concentrating his efforts on the individual herd. Help the owner, if he has a disease-free herd, help him to eradicate the disease and build up or assemble a disease-free herd. *Play your part in helping him to build up and maintain a disease-free herd.* Make use of such outside help and such specific tests as may be necessary and advantageous.

In the prevention of those diseases for which we have specific agents for immunization, it should be remembered that effective as many of them are, there is hardly ever a case where it is not desirable and often necessary to supplement their use, and with complete thoroughness, by all other recognized means of prevention. Further, in building up and maintaining a disease-free herd, live stock owners must stop altogether the indiscriminate buying of animals.

It is not possible to outline here or give in any detail the precautions that must be observed and the way in which a herd must be maintained to be kept free of disease. The general plan and the many details, however, must be carefully worked out and properly executed.

Usually live stock owners have considered that prevention was something to talk about but not to practice. We do not wish to say anything derogatory about the live stock industry of our country or those engaged in it. We do find, however, that there are numerous instances of owners finding themselves seriously involved with the problem of disease and using a dispersal sale as the best method of getting out of their difficulty. The attitude of reluctance on the part of the live stock owner to undertake prevention and eradication of disease is not altogether his fault. It is, first of all, we believe, a result of his community customs and lack of information. Therefore, one of our problems in the prevention of transmissible diseases, as it affects the individual herd, is the education of the individual live stock owner. He must become an aggressive convert to the merits of a disease-free herd, for without him as a unit upon which to build, success is far in the future.

In calling attention to the difficulties encountered in disease-prevention work, it is recognized that some are to be found in our own profession. A certain amount of readjustment and preparation must be made within our ranks. Rest assured, however, that the weak places which may exist are being corrected just as rapidly and just as permanently as possible.

The animal industry of the country always has been and always will be conducted, in the main, on a strictly economic basis. This explains very largely why prevention and eradication of disease, as a basis of procedure, has failed so often to be accepted by the owner or recommended beyond a certain point by his veterinarian. Usually neither party has felt, even when

working together, that sufficient benefit would result to warrant the expense and effort involved.

The initiation and execution of a plan of disease prevention is accompanied, in practically every case, with some initial sacrifice. The immediate loss is something that the owner can see and understand; the benefits to be secured in the long run are not so easy for him to estimate and feel assured of obtaining.

Another factor is that most owners are unable to see their way clear to change or modify their system of operation to meet even the most fundamental requirements of a disease-free-herd plan. They must not lose faith in the principle of prevention even in the face of adversity.

Our methods of attack, then, must always take into consideration the economic aspect of the live stock industry. The evidence is, however, that disease prevention is first, last and all the time economically sound.

In this report an attempt has been made to emphasize the opportunity for disease prevention, starting with the individual herd; the owner and his veterinarian initiating and carrying the work through to completion. The prevention of transmissible diseases of animals, wherein the private practitioner takes a leading part, may be considered by many to be an impractical and visionary ideal not possible of realization. It is appreciated how often the owner and the veterinarian are unprepared and the many difficulties to be met and overcome.

Dr. W. F. Draper, Assistant Surgeon General, U. S. Public Health Service, who was chairman of the Section on Prevention and Industrial Medicine and Public Health of the American Medical Association in 1927, chose as a subject for the chairman's address, "The Unexplored Field of Preventive Medicine in Private Practice." Every member of the veterinary profession should read that address. In veterinary medicine disease prevention in private practice is a new field with wonderful possibilities. If we were to speak as one practitioner to another we would suggest that some of us who have been out of school for some time are possibly not well informed on all phases of the problem. Sources of information should be made available; this service should be offered by organizations such as our national, state and local associations, through the publication of articles in the veterinary journals and by personal interviews and consultations. Conferences and short courses offered for veterinarians at the various veterinary colleges and experiment stations of the country might well devote considerable time to the problem of preventive medicine.

It may not be out of place for us to make the following suggestions: Whatever is done, there must be developed some uniformity of opinion and of methods of attack; such uniformity as might be developed need not destroy or in any way interfere with individual initiative. Further, the suggestion offered is not to interfere or replace the work being done by federal and state agencies, neither does it imply that there shall be no further expansion by those agencies. The suggestion made is for the development of a new and unexplored field in preventive medicine that is not at present being dealt with by any of the agencies now in operation, except in comparatively few instances. Further, our program of preparation should include:

Education of the public at large as to the nature and importance of our problems to them.

Cultivation of public appreciation of what our professional workers are trying to accomplish.

Publication of popular but truthful accounts of scientific information.

It frequently happens that the less reliable information is given wide publicity and that there is little or no publicity given to ideas, opinions and information coming from sources that are far more conservative, far more reliable, sounder in principle and supported by exact experimental findings.

In disease prevention accurate methods of diagnosis are vital. The veterinary profession should demand that the value of diagnostic agents and specific tests be established before being placed on the market or advocated. On the other hand we should stand ready to defend any reliable diagnostic agent or test which is being criticised and losing prestige due to inefficient application or misinterpretation of results.

As to ourselves, the work of each individual must be thoroughly dependable and must carry a prestige that will inspire public confidence.

The greatest contribution that this Association can make at this time, to the veterinary profession of the country, would be the dissemination of definite and concrete information on the problem of preventive medicine. A section in the official JOURNAL of the Association might well be made available for the publication of articles dealing with this problem.

The work of the Committee on the Prevention of Transmissible Diseases of Animals could be made more effective if each member were to serve five years, the Committee being organized at the start so that one new member would be appointed each year and all be eligible to reappointment. Such a committee, working with the cooperation of the executive officers of the Association, could do a wonderful piece of work of permanent value in assembling data; preparing material for publication; and directing and solidifying opinion among the widely scattered members of our organization.

The moulding of opinion within the profession will result in a greater degree of uniformity of action and methods and in turn, I believe, will be favorably reflected in the live stock interests of the whole nation.

"Prevention is the key-note of modern medicine."

(Appendix 1)

Rabies and Canine Distemper

By W. B. LINCOLN

The prevention of transmissible diseases of the dog is receiving more attention from veterinarians and laboratory men every year, which is as it should be. The two diseases receiving principal attention are rabies and distemper.

Rabies, from available statistics, is unquestionably on the increase in most if not all states, and is indeed causing the loss not only of more or less valuable dogs, but large numbers of all classes of live stock. The serious aspect of this disease is the deaths of human beings and the mental anguish and suffering caused thousands of people who are bitten by rabid animals every year, to say nothing of the large amount of money such exposure makes necessary for preventive or immunizing treatment. We as veterinarians should work for laws requiring the proper control and immunization of all dogs. This would be a stupendous undertaking, of course, but it could be done and, even if not done 100 per cent, would eventually eradicate rabies from this country. It is unnecessary in this report to point out the details of such a campaign.

Some progress is being made in the control of canine distemper. However, it is a difficult problem and our greatest hope lies in the development of some method of immunization. Until then we must make use of general preventive measures.

It seems likely that the English Commission working on the prevention and control of canine distemper may, in the not distant future, have something of real value to report, but as at present indicated little if any progress is being or has been made in handling canine distemper. It should receive the thoughtful consideration of all veterinarians.

(Appendix 2)

Transmissible Diseases of Swine

By ALVIN BROERMAN

In dealing with the transmissible diseases of swine, it may be of value to consider again the importance of sanitary management. Polluted soil is a very important factor in the transmission of many hog diseases.

Abandonment of permanent hog-lots, rotation of pastures, sanitary feeding facilities and a clean water-supply are essential to profitable swine-raising. Prophylactic measures of this nature will effectively prevent intestinal worms and many other diseases designated as "filth borne." Sanitation may not lessen the occurrence of hog cholera, swine dysentery or hog "flu." Never-

theless, the mortality of hog cholera may be influenced by having thrifty, healthy pigs and thus avoiding losses from so-called vaccination "breaks."

Losses from cholera, dysentery and flu may frequently be prevented by isolating newly purchased stock and those exhibited at fairs. The primary cause responsible for outbreaks of hog cholera can often be attributed to the shipping of infected hogs, feeding of garbage and offal from slaughter-houses not under inspection, the improper use of the serum-virus treatment, and the shipping of recently vaccinated swine.

The relationship of tuberculosis in swine and poultry must be seriously considered, as it appears that they are more easily infected with the avian type of tubercle bacilli than other farm animals. It is important that a plan of management be adopted to prevent the spread of tuberculosis in swine and thus reduce the losses from retentions at slaughtering establishments.

To eradicate the infectious diseases of swine, they must be attacked at their origin and this is generally the farm and shipping points. The shipping of sick hogs from the farm to market is frequently followed by disastrous results. Such a procedure is injurious to the industry, as it spreads the infection and causes heavy losses to the owners, as many swine succumb in shipment. Diseased hogs should be held on the farm until they receive proper treatment and all evidence of illness has disappeared. To lessen the dissemination of disease, it is important that all cars used for the transportation of swine be disinfected under supervision at the market centers.

(Appendix 3)

Parasites and Parasitic Diseases of Animals

By MAURICE C. HALL

The prevention of parasitic disease of animals predicates the application of control measures, as far as control measures are known. These control measures depend for their soundness and value on sound, accurate, scientific knowledge, and their application depends on a sound understanding of what is to be done and why it is to be done. The veterinarian is the logical man to apply these control measures in some cases and to direct them in others, providing he has the necessary understanding of them. To ensure this understanding, the veterinary colleges must supply adequate training in parasitology and the veterinarian in practice and elsewhere must follow as well as possible the developments in this field.

In addition to the competent veterinarian, parasite control depends on the following things: A comprehensive survey of the parasites of live stock throughout the United States, in order that the introduction of new parasites and of known dangerous parasites into new areas may be detected and put on record, and control measures applied before the parasites are well established; the establishment of quarantine when indicated, as for Texas fever, ticks or mange; the application of sanitation in general and of such special sanitary systems as have been developed; emphasis on the necessity for giving young animals special attention to protect them from parasites and the bad effects of parasitism, to which they are especially susceptible; the application of special control measures, such as the destruction of intermediate hosts; the destruction of parasites in meat-inspecting procedures; and the treatment of infected animals, to cut down the output of ineffective material at its source.

To put these control measures into effect it is necessary to have cooperation among those interested, including federal, state and county agencies, the practicing veterinarians, and the stockmen. Certain procedures, such as education, research, meat inspection and quarantine are matters of state medicine; others, such as treatment, are the business of the practicing veterinarian; others, such as the application of sanitation, are primarily the affair of the stockman. There are various overlaps in which effective control of parasite diseases depends on friendly and intelligent cooperation. The veterinary profession has an important role in extending our knowledge of parasites, applying known control measures, and cooperating with various

agencies in aiding in putting into effect measures for preventing the occurrence and spread of parasites.

(Signed) W. W. DIMOCK, *Chairman*.
W. B. LINCOLN
M. C. HALL
ALVIN BROERMAN
W. J. BUTLER.

PRESIDENT HILTY: What is your pleasure with this?

DR. WM. MOORE: I move the adoption of this report.

. . . The motion was regularly seconded, was put to a vote and carried. . . .

PRESIDENT HILTY: That is the last report of the afternoon. You now stand adjourned.

. . . The meeting adjourned at 4:50 p. m. . . .

ADJOURNMENT

THURSDAY AFTERNOON, August 9, 1928

The fourth general session convened at 2:10 p. m., President Hilty presiding.

PRESIDENT HILTY: In opening this session, just let me announce to you that the registration up to this minute is 1367. That is about 217 more than any registration to date. (Applause)

The first thing on the program this afternoon is the report of the Executive Board.

SECRETARY HOSKINS: The only report of the Executive Board is really a report of a special committee of the Board, and I am transmitting it to the Association exactly as the report was made to the Board. This is the report of the special committee which was appointed to look into the question of the feasibility or the desirability or the necessity for establishing a permanent home for the Association.

. . . Secretary Hoskins read the report. . . .

REPORT OF SPECIAL COMMITTEE ON PERMANENT HOME

GENTLEMEN:

The Committee appointed for the purpose of studying the proposal to secure a permanent home for the office of the American Veterinary Medical Association respectfully reports as follows:

1. We favor the proposition and recommend that it be put into operation at once.
2. We recommend that this Committee be continued and be authorized to put the necessary machinery into operation, to purchase a site and to supervise the construction of the building with the approval of the Executive Board.
3. We request the Association to place at the disposal of the Committee the sum of \$15,000 which, we think, will fully finance the project.

4. It is our opinion, as well as our recommendation, that Chicago is the logical location for this building.

(Signed) R. S. MacKELLAR, *Chairman.*

(Signed) C. A. CARY

(Signed) N. S. MAYO

(Signed) L. A. MERILLAT

(Signed) T. A. SIGLER.

PRESIDENT HILTY: What is your pleasure with this report?

DR. C. A. CARY: Mr. Chairman, I move it be accepted.

. . . The motion was regularly seconded, put to a vote and carried. . . .

PRESIDENT HILTY: The next in order will be the report of the Committee on Policy. Dr. Hoskins will read it.

. . . Secretary Hoskins read the report. . . .

REPORT OF COMMITTEE ON POLICY

MR. PRESIDENT AND MEMBERS:

The Committee on Policy held a meeting at Columbus, Ohio, March 23, 1928, at which time the matter of veterinary instruction to agricultural students was given thorough consideration, with the result that the Committee on Policy wishes to offer the following change in the Policy of the A. V. M. A., affecting paragraph 8, under Agricultural Extension, which now reads:

"Veterinarians affiliated with agricultural colleges and agricultural extension services should confine the instruction and advice given to agricultural students and live stock owners on veterinary subjects to:

(a) The fundamental principles of live stock sanitation;

(b) First aid, and

(c) The value of employing competent veterinary services in the diagnosis, prevention and treatment of animal diseases."

The Committee recommends that this paragraph be changed to read:

"Veterinarians affiliated with agricultural colleges and agricultural extension services should confine the veterinary instruction and advice given to agricultural students and live stock and poultry owners to accord with the recommendations of the Committee on Education."

The Committee requests that the Committee on Education revise the Boy Scout's Manual, with the recommendation that the Boy Scouts of America adopt the manual as revised. In this connection, it is recommended that Dr. Hoskins be requested to make arrangements with Mr. O. H. Benson, director of the Department of Rural Scouting, Boy Scouts of America, for holding a conference when most convenient.

It being the opinion of the members of the Committee on Policy that the activities of organizations operating animal shelters is a matter of vital concern to the welfare of the veterinary profession, it is recommended that the Committee appointed for the study of this problem give the same the earliest possible consideration and work out such recommendations as will be fair to the veterinary profession, the humane societies and the public at large.

It is a common practice of many Smith-Hughes high school instructors to give advice and treatment for the prevention and care of live stock and poultry diseases. The Committee is studying the situation with the hope of outlining some procedure by which this practice may be limited to the best interests of the industry and the profession.

(Signed) LEONARD W. GOSS, *Chairman.*

(Signed) REUBEN HILTY

(Signed) H. PRESTON HOSKINS

(Signed) M. JACOB

(Signed) T. E. MUNCE.

PRESIDENT HILTY: What is your pleasure with this report?

DR. J. C. FLYNN: I move that we approve the recommendations of the Committee.

. . . The motion was regularly seconded, put to a vote and carried.

PRESIDENT HILTY: We will now have the report of the Committee on Proprietary Pharmaceuticals. Dr. H. D. Bergman, Chairman.

DR. BERGMAN: Mr. Chairman and Gentlemen: I think it might be well to identify this report as a report of the Chairman, rather than the Committee as a whole, inasmuch as only one other member of the Committee, Dr. George H. Glover, is in attendance at the meeting and has specifically approved the report.

. . . Dr. Bergman then read the report. . . . (Applause)

REPORT OF COMMITTEE ON PROPRIETARY PHARMACEUTICALS

MR. PRESIDENT AND MEMBERS:

The appointment of a Special Committee on Proprietary Pharmaceuticals was made by President Hilty late in 1927, upon recommendation by the Executive Board that such a committee be appointed. This committee, then, is but an infant of only a few months of age. The functions of this committee, as suggested by the Executive Board at the time of its appointment, were as follows:

- (1) To investigate and report upon the accuracy of therapeutic claims.
- (2) To publish such reports in the JOURNAL of the A. V. M. A.
- (3) To publish Notices of Judgment obtained by the Food, Drug and Insecticide Administration.
- (4) To pass upon acceptability of advertisements submitted to the JOURNAL.

One hundred dollars was made available in the budget for the work of the Committee.

It is very obvious, then, that this brief report should be considered only as a progress report. It is merely tentative and informative and based upon certain contacts and experiences of the Committee during its brief existence, which would seem somewhat indicative of possible developments, future problems, scope of work and plan of organization necessary in connection with the activities of such a committee. It is not the intention to discuss details of the Committee's activities as regards individual projects to date. Certain constructive work has been done. This is a matter of record and, considering the few months of life of the Committee, would seem to be of some significance, if only to indicate in several instances the apparent prestige of such a committee of this organization and the readiness with which suggestions and opinions of the Committee have been accepted by several agencies. During the year, the Chairman has kept in touch with the Secretary-Editor, with whom he has cooperated on certain matters of JOURNAL advertising, and also with the Executive Board, to which body one written report has been submitted touching upon certain matters requiring consideration by the Board for possible future action.

Following the announcement of the appointment of such a committee of the A. V. M. A., inquiries began to come in from various agencies such as the agricultural press, daily press, commercial concerns, advertising agencies, National Better Business Bureau, and individual veterinarians, explaining their special problems and asking for information as to what cooperation

they might expect from this Committee toward their solution. These have been largely in the nature of requests for opinions on the fact or falsity of therapeutic claims and statements made in the collateral advertising of various proprietary pharmaceutical products. In our rather embryonic and unorganized state these requests have been handled as carefully and satisfactorily as possible.

Of considerable significance is the interest of the agricultural press in the work of this Committee.

Requests for cooperation and advice on the matter of acceptance or rejection of certain medical advertising have been received from several of the largest agricultural publications. There is on file with the Committee at present, a request from a representative of a group of agricultural publications for a conference and the cooperation of this Committee in the formulating of a uniform policy to be adopted by these publications in matters relating to remedy advertising. The Agricultural Publishers Association, with headquarters in Chicago, through its Executive Secretary, Mr. V. F. Hayden, has announced the existence of such a committee, together with its personnel, to its membership, with the statement that "The Committee will function particularly in the examination of claims in the advertising of such remedies, and present opinions as to whether or not these claims are well founded."

At a recent conference with representatives of the Committee, in Chicago, Mr. Hayden expressed a desire to develop advisory relations with the Committee and inquired regarding the possibility of the development by this Committee of a list of animal diseases for which no drug or combination of drugs is recognized as a cure, rational treatment, or preventive, by the veterinary profession; this list to be used by his organization as somewhat of an immediate guide in the acceptance or rejection of certain medical advertising.

The combined audited circulation of the agricultural papers affiliated with the Agricultural Publishers Association, which is a welfare organization, is over 8,000,000 per issue. Our experiences indicate that many of the highly reputable agricultural journals are looking for the kind of assistance that this Committee should be able to furnish and as the managing editor of one of the largest farm publications recently told the Chairman, "I should like nothing better than a representative committee of the A. V. M. A., to whom I can refer perplexing questions relative to medical advertising and thus be assured of a competent, unbiased and unprejudiced opinion." Apparently here is an important field of work for this Committee, which, if properly developed, can render a great service to the live stock industry and to the veterinary profession. The cooperation which the agricultural press has requested will, if offered, undoubtedly limit the exploitation of many questionable and worthless remedy products.

Another important contact made is with the Food, Drug and Insecticide Administration of the U. S. Department of Agriculture. A recent conference developed plans leading to full cooperation with this organization. In many instances the program and problems of the Food, Drug and Insecticide Administration are identical with those of this Committee, and close cooperation is to our mutual advantage. They propose to offer their resources, as far as possible, experience and findings to the work of the Committee, and expect in return such expert opinions from our organization as may have a bearing on their problems and projects and including at times the provision of expert help in connection with certain of their prosecutions. The Committee has already found certain rulings and interpretations of the Food, Drug and Insecticide Administration very valuable in the solution of certain matters.

The various experiences of the Committee over a period of a few months seemed to warrant the presentation of a progress report to the Executive Board, which was presented at its June meeting, in Detroit. It became apparent to the Committee that its duties and responsibilities were of such a nature as to necessitate considerable machinery in the way of policies, rules of procedure, interpretations, organization, etc., of which it seemed that the Executive Board should be advised and ultimately approve.

From all indications the actual work of this Committee need be limited only by the time the individual members can afford to contribute. The field is open. This is illustrated by the fact that an advertising agency recently reported to the Chairman that in one state alone, 1500 proprietary products of a remedial nature for the lower animals are being advertised and sold. Just how much time the members of such a committee can afford to contribute to work of this kind is an important one as regards results obtained. Experience and the future only can show the exact personnel and time necessary to handle the detail. The personnel of the Committee is vital to the interests of the cause as a whole, and especially the A. V. M. A. which it represents, and which will be responsible for its actions. The Committee must necessarily develop contacts with various agencies and render important decisions. The weight and acceptance of these decisions will depend to a large extent upon the personnel of the committee, i. e., as to the recognized competency, experience, connections, etc., of the individual members. For the above reasons the Committee should be rather permanent, the appointees to be approved by the Executive Board to assure competency, and responsible to the Executive Board, which should approve its rules of procedure, scope of work and general conduct.

Contacts with various agencies interested in remedy advertising indicate a marked desire on their part to develop advisory relations with a committee of this kind on the matter of certain advertising. While much of the interchange would possibly be confidential, the question arises as to the possible result of favorable decisions on certain remedy products being advertised to laymen, the sales of which would be greatly increased, were it known they were approved or accepted by the A. V. M. A. While undoubtedly many products will be excluded by various publications upon the advice of this Committee, the other side must be considered, i. e., that some will likely be accepted. This Committee apparently will function somewhat differently from the Council of Pharmacy and Chemistry of the A. M. A., which protects largely the medical profession itself against questionable therapeutic products. In addition to the investigation and report on products advertised and sold to the veterinary profession, there is the problem of products advertised and sold directly to laymen, the therapeutic claims for which may not be especially subject to criticism but in the hands of a layman the application may be entirely irrational.

This Committee must have certain definite purposes and rules governing its activities, requirements, interpretations, and methods of procedure. These should be approved by the Executive Board, as the activities of this Committee in dealing with outside agencies might result at times in situations and complications involving the A. V. M. A. The Committee is developing data of this kind at the present time—for example, an elaboration of the four brief statements of the purposes of this Committee, as suggested by the Executive Board, might be as follows:

1. To investigate and report upon the accuracy of therapeutic claims and the fact or falsity of any and all statements appearing upon the labelling and in collateral advertising, both printed and verbal, of proprietary pharmaceuticals offered to the veterinary profession and to the public.
2. To publish the reports of these investigations in the *JOURNAL* of the American Veterinary Medical Association, including a statement of the decision of the Committee in regard to the compliance or non-compliance of the preparation with its requirements.
3. To publish in the *JOURNAL* of the American Veterinary Medical Association the Notices of Judgment obtained in the Federal Courts by the U. S. Food, Drug and Insecticide Administration and also in State Courts against manufacturers or distributors of proprietary preparations, veterinary and otherwise as may be judged to be for the best interests of the veterinary profession, the labelling of which was in violation of the law.
4. To pass upon the acceptability for publication in the *JOURNAL* of the American Veterinary Medical Association of any and all adver-

tisements submitted to appear in that publication and relating in any manner to any proprietary preparation.

In further defining and explaining the various phases of work involved in the above four purposes, it becomes necessary to develop certain definitions, interpretations, rules, etc., for the guidance of the Committee and for the benefit of those who may be affected by committee rulings. Such is under way and includes several pages of data entitled, "Rules and Regulations of the Committee on Proprietary Pharmaceuticals of the A. V. M. A." They are not presented as a part of this progress report but will be filed with the Executive Board, when completed, for approval or suggestion. They purport to cover the four purposes of this Committee, as heretofore mentioned.

To avoid misconception as to the function of the Committee, with reference to Purpose 1, it might be well to note that it is to investigate the accuracy of therapeutic claims and the statements appearing upon the labelling and in the collateral advertising of proprietary pharmaceuticals, rather than conducting analyses and tests of the possible therapeutic efficacy of these products which latter would of course be impossible for such a committee under present circumstances. Opinions must necessarily be formed by the application of recognized scientific facts and principles of etiology, pathology, etc., as related to the disease in question and a knowledge of pharmacology and therapeutic limitations. The consensus of recognized veterinary medical and medical opinion, as collected from various available sources, must largely be used in passing on the majority of products.

The ideas and proposals presented in this progress report, bearing upon the possible activities of such a committee of the A. V. M. A., are presented at this time merely as informative of the field or work, opportunities, and possible complications involved, as attained by a few months of thought and experience. Of primary importance is the fact that this Committee must be well organized, with certain established and approved rules and regulations for its guidance. The scope of work, methods, details of work, etc., must necessarily be worked out in close cooperation with and approved by the Executive Board, as its duties, contacts, etc., will be of such a nature as to reflect directly on the A. V. M. A., which it will represent. The question of finance is involved. In this connection it may be stated that already there has come the suggestion from two organizations of national importance that the A. V. M. A. be represented at their conferences, inasmuch as the proceedings of these conferences have a direct bearing upon certain phases of work in which the A. V. M. A., through this Committee, should be recognized.

The results of only a half-year's observations and experiences would seem to indicate that such a committee is pioneering in a field with opportunities to make contacts which should mean recognition and increased prestige for the A. V. M. A. and with a possibility of producing results which will be of pronounced benefit to both the live stock industry and the veterinary profession, provided that the work is conservatively and intelligently handled and that ways and means can be developed for carrying it out. Whatever degree of success such a committee may have, in the handling of its outlined duties, will depend largely on the amount of time and attention the personnel of such a committee feel that they can devote to affairs of this nature, not in line of their regular duties. This is a vital point. The difficulty of handling the peculiar duties of a committee of this kind, with the members scattered over the entire country, is also at once apparent. A year or so of experience should demonstrate that if the A. V. M. A. is going to enter into work of this nature, some kind of a permanent organization will be necessary to carry it out successfully.

From the experience of the past year, the Chairman questions very seriously whether any individual member of this organization can afford to give the time required of the Chairman, at least of a committee of this kind, to carry out the various functions of the Committee as they will and should develop. This Committee should unquestionably head up in the Association offices. The chairmanship is a full-time job for one man. One has only to look to the similar organization of the A. M. A. to realize this. There is no more important field of endeavor that this Association can enter than the field of

this Committee. It should be carefully cultivated, and the problems studied by this Association, looking toward the future development of ways and means within the Association of offering the cooperation which is being requested, and also taking the initiative in the matter of questionable proprietary pharmaceuticals in so far as the resources of the Association will permit.

(Signed) H. D. BERGMAN, *Chairman*.
R. S. AMADON
R. A. CRAIG
G. H. GLOVER
R. W. GANNETT.

PRESIDENT HILTY: At this time we will have a discussion of this report by Dr. B. T. Woodward, of New York.

DR. WOODWARD: I want you especially to remember the closing words of the chairman of the Committee. I agree with him heartily, and through rather a long experience in the enforcement of the federal Food and Drug Act, I feel that the A. V. M. A. has at last stepped into a field where it really should have been active years ago, just as is the case in the sister organization, the A. M. A.

You will find that this Committee's work, or, as, is suggested by its Chairman, the work being conducted under the main office of the Association, is probably the most important which has been undertaken in recent years. It will certainly develop more and more and, as it develops, each member will realize how important the work is, not only to himself, for his professional standing and for his financial improvement, but for the standing of the veterinarian as a professional man.

In figuring on discussing this report, I thought probably the best way would be to present it in a brief paper, which would outline to you some of the reasons why this work should be undertaken.

. . . Dr. Woodward then read his prepared discussion.

. . . (Applause)

(To be published in the JOURNAL.)

PRESIDENT HILTY: Not wishing to take away a bit of the importance from any other committee report, men, I think Dr. Bergman's report is one of the most important, if not the most important, committee report that this Association will receive at this meeting. I feel we ought to give a few minutes, possibly ten minutes, to the discussion of this report, if any of you would like to have the floor for that.

DR. G. G. FABER: These two reports bring to my mind a couple of very important incidents which occurred during my practice. One occurred several years ago when I graduated. In

those days they used to call what they commonly term now "mineral feed" just plain "hog remedy." It was sold extensively over the country. Finally this hog remedy business wore out.

† Agricultural colleges began putting on experiments, and they finally named these different preparations "mineral mixtures." Mineral mixtures finally wore out, and now they term them "mineral feeds," largely because agricultural colleges and others who did experimental work claim they have some food value; therefore, they are feeds.

The story I want to give you is one of a barber in our town who quit the barber business and went to selling a hog remedy. He was on the road two weeks. He came into my office and said, "George, let's go into the hog remedy business."

I said, "Good business, is it?"

"Yes, you bet. I have been out just two weeks, and I made \$175 as my commission."

That was probably more money than he had made in his whole life.

I said, "Well, that's fine."

"Yes, it is. That is a lot of money. I know the company that puts the stuff out made a lot more money than that out of it."

I said, "What do you think a hog remedy should have in it to be good for the hog, good for the hog-owner, good for the manufacturer of the product and the man that sells it? There are a good many concerned here."

"Well, George, I don't know. I am no chemist; I am no veterinarian. I don't know a damn thing about feeding hogs."

That was one experience. Dr. Hoskins, in the report of the Committee on Policy, brings to my mind another. It was also brought up in this last report. During the 1927 legislative session in our State, I spent twenty-three days at our state capitol lobbying for a bill we had before the House. One representative from a county where the Smith-Hughes teacher did practically all the veterinary work stuck by the Smith-Hughes man through thick and thin. I brought this argument to him: "If you will get rid of this fellow who is just a temporary man in your community—as soon as he gets a better position some place else he will take it; he will leave your farmers without this assistance they have been getting—and get a good graduate veterinarian to locate, he will be a permanent fixture."

He said, "Well, I took this up with our Smith-Hughes man and he said if we could get a law through that would protect him, he would go and take a four-year veterinary course and come back and locate there. 'As it is, if I go and take the course and get in here and get a nice business established, these fellows will hire another Smith-Hughes teacher that will turn around and put me out of business.'" (Laughter)

So we either have to quit teaching these agricultural students veterinary science, or go out of business; that is all.

The report of the Committee on Permanent Home for the A. V. M. A. has been accepted as a report only. I for one sincerely hope that \$15,000 will never be spent for a permanent home until they spend \$15,000 or more in advertising the veterinary profession. There has been a great deal of talk through our journals about changing the name of the veterinary profession. This profession has been a profession perhaps for some 150 years, and yet there is about one one-hundredth of one per cent of the people of the United States today who know what a veterinarian is and what his duties are to the live stock industry.

If we had some way of educating the public—this will probably come up in the report of the Committee on Intelligence and Education—as to what a veterinarian is, it would be a good thing. Rather than to change the name of the veterinary profession, I say change the definition of a veterinarian.

PRESIDENT HILTY: Is there anyone else? If not, what is your pleasure with this report?

DR. WM. MOORE: I move we accept it.

. . . The motion was regularly seconded, was put to a vote and carried. . . .

PRESIDENT HILTY: The next is the report of the Committee on Tuberculosis, Dr. C. E. Cotton, Chairman.

. . . Dr. Cotton read the report. . . . (Applause)

REPORT OF COMMITTEE ON TUBERCULOSIS

Foreword

The Committee believes that it would be most appropriate at this time and place to dedicate a few words to the memory of two colleagues, staunch friends and supporters of this Association, Dr. E. C. Schroeder and Dr. J. A. Kiernan.

Doctor Schroeder spent a large part of his lifetime in the study of tuberculosis, and through his long, patient and laborious researches, his critical mind and logical deductions, and his clear, concise manner of expression, made contributions to our knowledge of tuberculosis of great importance and value.

The international recognition accorded to him was justly merited and a source of pride to the veterinary profession.

His active interest in our annual deliberations over a period of many years and his kindly familiar face will be sadly missed.

He endeared himself to all his colleagues and won from them a lasting affection. May those who follow him strive faithfully for the attainment of the objective to which he devoted his best and greatest endeavors—the eradication of bovine tuberculosis.

Doctor Kiernan, throughout his professional career, impressed his associates with his wonderful degree of energy, aggressiveness, powers of expression, sound judgment and executive ability. The marked progress which has been attained in the eradication of tuberculosis on this continent, in the last decade, can be attributed largely to the persistent and untiring efforts of Doctor Kiernan. His intense interest as a member of the Committee on Tuberculosis and his brilliant discussions at our annual association meetings will be missed. His friendly and pleasing personality, together with an unbounded effort in his field of endeavor, won for him many true friends as well as the respect and the admiration of his colleagues.

May we strive to emulate the noble example set by these two broken pillars of our profession and deliver the best we have in that priceless gift, "Service to Humanity."

Progress in Eradicating Tuberculosis in Live Stock in the United States and Canada

The work of eradicating bovine tuberculosis from among the cattle of the North American Continent made very satisfactory progress during the past year.

PROGRESS IN THE UNITED STATES

As a result of the cooperative work between the cattle-owners, live stock commissioners, live stock sanitary officials of the states, and the federal government, there were tuberculin-tested during the fiscal year 1928, 1,002,689 herds, containing 10,826,280 cattle, resulting in 259,435 reactors being disclosed. It is interesting to note that this is an increase of approximately 1,600,000 over the number tested during the preceding year, or an increase of 16.9 per cent. There were 1119 counties as accredited or working under the area plan on July 1, 1928.

TABLE I—Progress in tuberculosis eradication

STATE	MODIFIED ACCREDITED COUNTIES	ACCREDITED DURING FISCAL YEAR 1928	COUNTIES YET TO BE ACCREDITED
North Carolina.....	93	11	7
Michigan.....	55	13	28
Iowa.....	43	13	56
Kansas.....	35	15	70
Nebraska.....	29	8	64
Wisconsin.....	27	16	44
North Dakota.....	26	7	27
Ohio.....	20	7	68
Idaho.....	19	4	25
Illinois.....	17	10	85
Minnesota.....	15	6	72
Pennsylvania.....	14	5	53
Maine.....	12	8	4
West Virginia.....	11	6	44
Oregon.....	4	0	32
Totals.....	420	129	679

There were 129 counties accredited last year, which brings the total number of modified accredited counties up to 527 on July 1, 1928. There are in these 527 counties over 10,500,000 cattle. In square miles this modified accredited area represents territory as large as all of the states east of Illinois and north of Tennessee and North Carolina. Table I reflects the progress that is being made in area work in 16 widely scattered states:

Avian tuberculosis is now receiving more attention than ever before, there having been inspected last year more than 230,000 flocks, containing approximately 21,000,000 birds. Of these flocks 16,000 were found to be affected with tuberculosis.

SHORTAGE OF MILK

When the campaign to eradicate tuberculosis was launched in 1917 the prophecy was made that a milk famine would result; also that the milk would be so expensive that the poor people could not buy this important food. That these prophecies were erroneous is reflected in the report on the amount of milk used per capita in 1918 as compared with the amount now being used. This report shows that approximately 30 per cent more milk is now being used than was the case ten years ago. It is interesting to note this increase, in view of the fact that 1,500,000 reactors have been slaughtered since 1918 of which number approximately 85 per cent were dairy animals. Approximately 63 per cent of the cattle tested under the cooperative plan were dairy cattle, while 37 per cent represented the beef breeds.

PROGRESS IN THE DOMINION OF CANADA

Tuberculosis control and eradication is likewise making substantial progress and giving satisfactory results in the Dominion. The projects under which the work is conducted are:

1. Supervised herd plan, adopted in 1905.
2. The Municipal Tuberculosis Order, adopted in 1914.
3. The Accredited Herd Plan, adopted in 1919.
4. The Restricted Area Plan, adopted in 1922.

The statistics of the Health of Animals Branch, Department of Agriculture, for the fiscal year were not complete at the time of this report. However, they indicate that tuberculous infection of cattle, as indicated by the tuberculin test, is declining. This reduction is shown most markedly over a period of seven to eight years, the average percentage of infection for the period 1920 to 1927 being 10.8, while during 1927 these figures were reduced to 3.2 per cent. A marked increase in the number of cattle tested over the previous fiscal year ended March 31, 1927, during which period more than 367,000 cattle were tested, is also indicated.

There were five restricted areas where the percentage of infection has been reduced to a fraction of one per cent. A gain of 18.6 per cent in the number of fully accredited herds is recorded. Results of the more recent work indicate that the area plan is the most efficient and economical as well as logical plan to pursue.

It has been demonstrated beyond doubt that individual herds can be freed and kept free from tuberculosis, and that in large areas infection can be kept down to less than one-half of one per cent. There have been difficulties, many of them; suspicion, opposition, failure to take the necessary precautions, evasions of regulations and restrictions, etc., but all of this has steadily given way to greater confidence and cooperation, and there is a rapidly growing demand for assistance under one or another of the existing policies.

Reliability of the Tuberculin Test in the Field as Related to Postmortem Findings

Statistics collected from the official records of the United States and Canada show that, in approximately 90 to 93 per cent of all tuberculin-reacting cattle, evidence of tuberculosis is clinically demonstrable at the usual postmortem examination. The remaining 7 to 10 per cent of reactors, constituting the so-called "no-visible lesion" cases, amount to only 0.3 to 0.5 per cent or 3 to 5 per thousand of the total number of cattle tested. Furthermore, it has been proven by laboratory methods of examination and test-inoculation that

many (20-25 per cent) of these "no-lesion" reactors are actual carriers of virulent tubercle bacilli; and it is safe to assume that more (at least double the number of the proven carriers) would fall in the same category were it practicable to submit the entire carcass, instead of only a small sample of it, to exhaustive methods of laboratory examination and test-inoculations.

Although the percentage of "no-lesion-reactors" has a very low average, it varies considerably in initial tests and at successive tuberculin tests in different herds, districts and areas, ranging from a high of several times that of the average, to a low of zero. The former is sometimes used as a basis of attack by opponents of the test and is apt to give rise to misapprehension and mistrust on the part of herd-owners who have not rightly understood the proper meaning of a tuberculin reaction and who may have been wrongly advised and misled as to the significance and interpretation of it. The fact that we do find "N-V-L" reactors, and in varying numbers and percentages, in herds of cattle subjected to the tuberculin test, is in no wise an extraordinary or disconcerting fact; neither is it illogical or inconsistent with present-day knowledge of the biology of the tubercle bacillus, of the varying types of infection, and of the varying degrees and kinds of resistance to it, inherited or acquired by human and animal hosts.

A point which this Committee would like to stress is that a tuberculin reaction signifies *infection*—tubercle bacillus infection and not tuberculous *disease*—and is dependent upon a sensitization of the human or animal tissues as a result of contact with the tubercle bacillus. The absorption or harboring of tubercle bacilli, sufficing to sensitize animal tissues, does not always or necessarily result in or lead to tuberculous processes visible to the eye. Infection may be tolerated or held under complete arrest for an indefinite duration. Further, it has been shown by the experimental method that infection with modified or attenuated living tubercle bacilli, as, for instance the Bacillus Calmette-Guérin, and certain other well-known laboratory strains, sensitizes the animal and enables it to react to tuberculin, and may even invade the lymphatic system but not necessarily be productive of discernible lesions. Schroeder suggested that sensitization of cattle to tuberculin may result from the absorption of tubercle bacilli from human sources. Schalk and others have shown that cattle may be temporarily sensitized to avian tuberculin through the absorption of tubercle bacilli of the avian type, even though such cattle appeared negative to bovine tuberculin. Positive evidence is always more direct and significant than negative evidence and if we take into consideration the fact that attenuated tubercle bacilli and intermediary types of tubercle bacilli do exist in nature, we have to recognize the possibility of bovine animals being sensitive to tuberculin as a result of an infection which does not necessarily cause discernible disease. The right to conclude that an animal is not affected with the *disease*, when no evidence of it is discernible at postmortem examination and when bacteriological and microscopical examination and animal inoculation tests are negative, may at times be justifiable; but even so, there is no right to conclude that the animal is free from infection or that the tuberculin reaction was not a result of the presence of tubercle bacilli somewhere in the animal's system.

It is more reasonable to question the reliability of a negative tuberculin test than that of a positive diagnostic reaction. The possibility of the latter occurring in an animal entirely free from tubercle bacillus infection is an extremely slight one and deserves less consideration than the greater and more serious possibility of an animal harboring tubercle bacilli being incapable of giving a tuberculin reaction. It is illogical to expect to be able to *confirm* by postmortem findings the sensitization of an animal to the tubercle bacillus as indicated by the tuberculin reaction, since we know that sensitization can be brought about before visible lesions are in evidence.

In bovine tuberculosis control and eradication work in the United States and Canada we aim to destroy "infection" and the sources of infection and thus to prevent disease; if the disease was in evidence in all animals reacting to the test it would be a reflection upon the usefulness of the test itself. As

a means of detecting infection the tuberculin test, though not perfect, has proved extraordinarily successful and reliable, and as such is endorsed without reservation by this Committee.

Anti-Tuberculosis Vaccination

The new method of prophylactic vaccination of cattle against tuberculosis, as announced and recommended by Professors Calmette and Guérin, of the Pasteur Institute, France, continues to excite much interest and attention, and not a little speculation as to its ultimate outcome.

The vaccine, known as B. C. G. (*Bacillus Calmette-Guérin*) is a freshly prepared suspension of living tubercle bacilli, originally of virulent bovine type, but now greatly attenuated. This vaccine is said to be absolutely harmless to the animal free from tuberculosis infection, and efficacious as a preventive of tuberculosis when administered to new-born calves, and also to new-born children.

B. C. G. vaccination of cattle is said to be undergoing extensive trials as a practical means of prophylaxis upon farms in France, Belgium, Holland, and some other European countries. Reports are slow in forthcoming, and must be awaited with patience, for, obviously, trials must be extended over a period of years and under varying conditions before it will be possible to arrive at definite conclusions as to the effects, safety and practical value of immunizing cattle with this living tubercle bacillus, B. C. G.

The great importance and value of the researches carried out by Professors Calmette and Guérin have a world-wide recognition. The announcements made, however, are regarded in some quarters as premature. Some eminent authorities and investigators, both in Europe and in America, whose work and opinions command respect, are not in accord with the views of the French workers and are actually challenging some of the claims made.

On this continent, B. C. G. vaccination of cattle is at present considered, and we think wisely so, as a question for very careful study, and as a subject for research and close investigation. There have already appeared some important modifications of the theories advanced to explain its properties and mode of action; also of the conditions under which it should be applied for the immunization of cattle. It is now admitted that these living attenuated tubercle bacilli do not confine their activity to the localized or focal lesion formed at the site of inoculation, but invade the lymphatic system, giving rise to hypertrophy of the lymphatic glands and a general reaction, and may even cause the formation of small tubercles which, it is claimed, undergo healing and resorption. As a result of vaccination the animal becomes sensitized to tuberculin and capable of giving a tuberculin-test reaction.

Even though B. C. G. vaccination may fortify resistance to such an extent as to prevent the development of active tuberculosis, it does not prevent infection when the animal is exposed to it, does not prevent the absorption of virulent tubercle bacilli, nor can it be shown to destroy such bacilli, and it does not prevent the vaccinated animal from becoming the carrier and, therefore, the possible eliminator of virulent tubercle bacilli. The fact that a B. C. G.-vaccinated animal may take in and harbor virulent tubercle bacilli and not suffer ill effects, has been pointed to as evidence of a high degree of immunity obtained, which, if true, does not lessen the danger or at least the potential danger of such an animal, to those with which it comes in contact and which have not been so vaccinated.

The efficacy of B. C. G. vaccination, as a practical measure for preventing bovine tuberculosis, still awaits confirmation.

The question of the harmlessness or inoffensiveness of B. C. G. is still a controversial one, and although Professors Calmette and Guérin have affirmed and reaffirmed again and again that it is absolutely avirulent, incapable of causing tuberculosis, and innocuous, and are supported in this by the experimental results obtained by a number of independent investigators; others in Canada, Germany, Italy and South America have been unable to substantiate the claim and express grave doubts as to its validity.

Experimental research conducted by the Department of Agriculture of the Dominion of Canada, on *Bacillus Calmette-Guérin* and the effects of vaccination, indicates that the vaccinating tubercle bacilli are capable of virulence and that vaccination does not adequately protect calves from tuberculosis when exposed to severe natural contamination.

In countries where the incidence of tuberculosis in cattle is so extremely high that an eradication policy by slaughter methods is economically impossible, extensive trials with B. C. G. vaccination may be warranted.

This committee, in view of the successes achieved and the marked progress being made on this continent under the policies and plans put into effect during the past decade, and ever mindful of the insidious character of tubercle bacillus infection, believes that the detection and destruction of existing sources of infection should continue to be the main objective in our anti-tuberculosis campaign and recommends the utmost caution in accepting, both as regards safety and efficiency, the claims made for B. C. G. vaccination or in proceeding to the practical application of a more or less untried method which would destroy the value of our most precious weapon—the tuberculin test.

Governmental Policy of Control

The results of ten years' work disclose that the basic policies for the elimination of tuberculosis from the live stock of North America, as recommended and adopted by the government authorities of the United States and Canada and approved by the United States Live Stock Sanitary Association in 1917, has the approval of ninety-five per cent of the live stock owners in areas where the work has been completed. This confidence on the part of owners who have experienced the results of these sound policies is inspiring those in untested areas to adopt the plan.

The best policies devised by man for the elimination of tuberculosis from the herds and flocks of a nation would fail without the use of tuberculin, as it is today the only known scientific agent that can be applied on an extensive scale in detecting tuberculous infection in animals which appear healthy and sound. The fact that tuberculin was known and used as a diagnostic agent for twenty-five years before it was given the stamp of approval in official control work by the federal government and states does not justify the criticism by laymen for not adopting these successful policies at an earlier date than 1917, for the purpose of reducing the economic waste resulting from the ever-increasing number of tuberculous animals from 1900 to 1917.

The adoption of the plan by governmental authorities was not undertaken until the members of this Association had used tuberculin as a diagnostic agent on a very large scale for a period of twenty-five years and until it had been conclusively proved that tuberculosis could be economically eradicated from individual herds, and that tuberculin had no deleterious effect on healthy animals. Prior to the adoption of the plan, the veterinary scientist had studied and investigated the pathogenesis of the disease as disclosed in the different species of animals and had also standardized the preparation of tuberculin.

The application and interpretation of the tuberculin test as a scientific diagnostic agent had also been fully accepted and endorsed by the highest authorities on tuberculosis as a result of the combined study of the laboratory investigator and the veterinarian engaged in the practical application of the test in the field.

In the ten-year campaign in the field, to eliminate the disease from live stock, combined with experimental research, more knowledge has been acquired relative to tuberculous infection, improvement of technic, and as a result, increased the progress toward our objectives.

Recommendations

The Committee recommends that this Association endorse the enforcement of the Uniform Rules and Regulations that have been adopted by the governmental agencies for the eradication of the disease under the Area Plan, and that the Association go on record that there should be no relaxation in the administration of the present rules and regulations.

The Committee further recommends that the Association approve the adoption of amendments to the present rules and regulations, providing more rigid requirements in order to prevent the introduction of tuberculosis into such areas.

(Signed) CHARLES E. COTTON, *Chairman*.

(Signed) E. LASH

(Signed) J. W. HANBY

(Signed) E. A. WATSON

(Signed) J. I. GIBSON.

PRESIDENT HILTY: What is your pleasure concerning this excellent report?

. . . A motion was regularly made, seconded and carried that the report be adopted as read. . . .

PRESIDENT HILTY: The next is the report of the Committee on Abortion, Dr. F. B. Hadley, Chairman.

. . . Dr. Hadley read the report. . . .

REPORT OF COMMITTEE ON ABORTION

MR. PRESIDENT AND MEMBERS:

Your Committee on Abortion is of the unanimous opinion that its report this year should be limited to a discussion of the control and eradication of bovine infectious abortion, especially in regard to herd management. The plans to be discussed are based on sound scientific and economic principles and have been found to be workable and to give entire satisfaction in many herds where they have been followed. The report is presented with the hope that practitioners will secure from it some helpful suggestions which they can use to advantage when advising with owners of cattle concerning the solution of their abortion problems.

The only successful method for controlling and eradicating bovine infectious abortion at present known is founded upon the results of blood-tests. The details of herd management depend upon the extent of the infection, as revealed by the blood-test and the facilities available for carrying out the recommendations.

THE REACTING OR INFECTED HERD

If the herd history and blood-test show that infectious abortion has secured a firm foothold and the herd contains a number of valuable reactors, a reasonable plan of management provides a means of keeping the animals. The plan is grounded upon the fact that the reactors have been exposed to the infection and that they have some tolerance to it. Such cows may not abort in the future, so are valuable as milk-producers, but are more likely to develop breeding failure than are clean cows. It should be understood that, while the abortion rate may be held in check by this plan, bovine infectious abortion can never be eradicated, so the plan is at best only a temporary expedient.

THE NON-REACTING OR CLEAN HERD

The clean herd is one in which there are no reactors to the blood-test. In order to establish and maintain a non-reacting herd, all animals that react to the blood-test must be promptly removed. At the outset, tests must be made more frequently than later on, in order to detect recently exposed animals. After the herd has passed three consecutive tests, at intervals of at least six months, it can qualify as clean. To insure success, attention must be paid to details and the owner must have reasonably good stable facilities and be willing either to sell at once all reacting cattle or to maintain two herd units.

THE TWO-UNIT HERD

When it is desirable to retain most of the cattle in a given herd, the animals may be divided on the basis of the blood-test into reacting and non-reacting

groups, each of which is to be maintained as a unit, with no contact between the animals in the two units. For best results separate attendants should be provided for each unit, although some herds have been cared for satisfactorily by common attendants. Especial attention must be given to prevent the carrying of infection from the diseased to the clean animals by caretakers, by contaminated feed and drink, and by other possible carriers.

It is possible that for some time after dividing the herd into two units, abortions may occur among the negative group. This may be confusing, unless it is realized that the agglutination test does not disclose animals in the incubative stage of the disease.

RULES FOR MANAGING THE REACTING HERD OR REACTING UNIT

The ultimate aim of the owner of reactors should be to dispose of them as soon as he can arrange to do so, because they are likely gradually to become unprofitable. However, a herd of reacting or positive cows may be managed profitably, at least for a time, if the owner will:

- (1) Dispose promptly of all low-milk-producing, barren and otherwise unprofitable cows;

- (2) Add only mature reacting cows for replacements;

- (3) Raise the most promising calves for the establishment of a clean herd to replace the reacting herd—these calves should be segregated before they are a year old, and earlier, if possible—and

- (4) Blood-test the young stock from time to time to detect cases of abortion infection early and thus prevent extension of the disease in them.

It is beyond the scope of this report to give detailed recommendations for the management of infected herds. Those especially interested in this subject, as well as in the pros and cons of vaccination and other phases of the abortion problem, are referred to veterinary literature reporting the results of experimental work.

RULES FOR MANAGING THE NON-REACTING HERD OR NON-REACTING UNIT

After removing all cattle that react to the first blood-test, the problem is to prevent the further extension of the disease in the remaining non-reactors or clean animals. To accomplish this it is recommended that the owner:

- (1) Feed a ration adequate to maintain the physical condition of the cattle;

- (2) Keep the stable and premises in a sanitary condition;

- (3) Record all service and calving dates;

- (4) Isolate immediately for observation and blood-testing all animals that abort, or threaten to abort;

- (5) Clean and disinfect the stalls and gutters of cows that abort, and destroy the fetus, placenta and contaminated litter;

- (6) Provide a disinfected maternity stall for exclusive occupancy by cows at calving time (advisable but not mandatory);

- (7) Restrict the service of herd bulls to cows which have passed the blood-test;

- (8) Retest all animals over six months old every three months, or oftener, if the authorities so direct, until all have been negative for at least one year, in order to detect and weed out sources of abortion infection—subsequent retests should be made annually—and

- (9) Secure for replacements animals from clean herds, preferably calves.

The safest additions from other than clean herds are non-reacting calves from non-reacting dams. Calves from an infected unit or herd may be added following a period of isolation and a negative blood-test. Pregnant animals from other than clean herds should not be added until after having passed a negative blood test at least two weeks subsequent to calving. All other cattle brought to the farm should be kept in quarantine sixty days and then be required to pass a blood-test before being turned with the herd.

THE CLEAN HERD MORE PROFITABLE

Both calf-production and milk-production in clean herds have been so much greater that the owners and herdsmen have become enthusiastic supporters of this plan of management. A small percentage of abortions due to causes other than *Bacterium abortus* may be expected in the clean herd, yet

dairymen, who have followed this plan for a number of years, state that they would not think of trying to maintain a dairy herd unless it is blood-tested and kept free from infectious abortion.

In the clean herd, as a rule, fewer cases of retained afterbirth and of garget are likely to occur. The sterility rate is not so high. The breeding efficiency of the clean herd is as near 100 per cent as it is possible to secure. While the breeding efficiency of the reacting herd, consisting entirely of reactors and aborters, may be fairly satisfactory, the breeding efficiency of a mixed herd, consisting of both non-reactors and reactors, is usually unsatisfactory.

WHAT TO TELL THE OWNER

These plans for herd management should be clearly explained to the owner, but he should not be urged to adopt any one of them, as he will be better satisfied with results if it is left for him to decide.

It is advisable to inform the owner at the outset that abortions may occur in negative cows and that he should not expect 100 per cent freedom from sterility and other breeding troubles. It is justifiable, however, to assure him that the results from maintaining a clean herd will be satisfactory, if the rules for herd management, as herein outlined, are strictly observed. The owner should also be told that certain cows which react to the blood-test, although they have never been known to abort, probably have, without the attendants knowing it; that other reacting cows never have and never may abort; and that occasionally cows are encountered which do not react until after they abort or calve at full term. This information will help him to appreciate the limitations of the test, as well as its significance, and prevent him from putting an unwarranted interpretation upon the test.

In order to avoid the possibility of farmers securing the false impression that cattle which fail to react to the blood-test will never abort, the Committee recommends dropping the terms "abortion-free cows" and "abortion-free herds" when speaking as well as when writing about cattle abortion.

The Committee feels that its work in the future can be materially strengthened by meeting as a body at least once each year. In line with this feeling we request the Budget Committee to recommend to the Association an appropriation of \$200 annually for this purpose.

(Signed) F. B. HADLEY, *Chairman*.

(Signed) M. F. BARNES

(Signed) E. T. HALLMAN

(Signed) C. P. FITCH

(Signed) HERBERT LOTHE

PRESIDENT HILTY: What is your pleasure with this excellent report?

. . . It was regularly moved, seconded and carried that the report be adopted. . . .

PRESIDENT HILTY: The next in order is the report of the Committee on International Veterinary Congress, by Dr. Adolph Eichhorn.

DR. EICHHORN: Dr. Mohler is unavoidably absent this afternoon, and he asked me to render the report.

The last International Congress was supposed to be held in London, in 1914. However, after the first day's session, on account of the World War, it had to be closed abruptly. Due to the unpleasant relations which existed between some of the different nations since that time, no effort was made to organize another International Congress.

However, on May 11 of this year, the Permanent Committee again convened in Paris, and proceeded with the organization of a Permanent Committee for the purpose of holding the next congress.

At this meeting Professor Hutyra, of the Royal Veterinary College of Budapest, was chosen as president of the coming congress; Sir John M'Fadyean, vice-president, and Professor E. LeClainche, the head of the Veterinary Service of France, as second vice-president. Professor de Blicke, of Holland, has been selected as secretary-general, and Burgi, the head of the Veterinary Service of Switzerland, has been selected as the secretary. Professor Sheather, of England, together with representatives of twenty-one countries, will constitute the Committee. Now the organization is in full progress.

The date has already been set. It has been decided that either the latter part of July or the first week in August, 1930, should be established as the date for the coming Congress. It is hoped that the good feeling which prevailed prior to the World War will again be re-established, and a great deal of work of international character and for the mutual interest of the veterinary profession in the different countries will be carried out on the occasion.

Mr. President, I move the approval of this report. I have other recommendations to make.

. . . The motion was regularly seconded, was put to a vote and carried. . . .

DR. EICHHORN: As the Committee is appointed by the President, and in view of the fact that a great deal of work will be required to organize the Permanent Committee in this country, I would recommend that the Committee should function until the conclusion of the next International Congress. I make that motion.

. . . The motion was seconded by Dr. Kinsley. . . .

PRESIDENT HILTY: It has been moved and seconded that the Committee on the International Veterinary Congress be continued until the close of the next Congress.

. . . The motion was put to a vote and carried. . . .

DR. EICHHORN: In 1914, at the time of the last International Congress, we organized an official tour from this country. From the experiences of those who participated, it was generally accepted that such an official tour is worth while. If official recognition can be obtained through the proper authorities in this

country, and possibly also in Canada, a great deal of advantage can accrue to such a party, inasmuch as everything worthwhile pertaining to veterinary activities will be shown to the party.

Through the request of the Secretary of Agriculture, the Department of State will be requested to inform our foreign embassies of an official tour from the United States, and in turn the embassies will inform all the foreign officers to the countries we are to visit, in order that we may obtain the proper recognition.

Therefore, inasmuch as the time required for the organization of such a tour is considerable, I move that the Committee be authorized to proceed with the organization of such an official tour of the A. V. M. A.

DR. KINSLEY: I second the motion.

PRESIDENT HILTY: Will you restate the motion?

SECRETARY HOSKINS: The motion is that the Special Committee on the International Veterinary Congress be authorized by the Association to proceed with making the necessary arrangements to get the proper recognition for this tour, as the official tour of the American Veterinary Medical Association.

. . . The question was called for, put to a vote and carried.

PRESIDENT HILTY: The next in order will be the report of the Committee on Distemper. Dr. Hoskins will read it.

SECRETARY HOSKINS: Dr. John Reichel, chairman of the Committee, is unavoidably absent and has forwarded a very short report.

. . . Secretary Hoskins read the report.

REPORT OF COMMITTEE ON DISTEMPER

MR. PRESIDENT AND MEMBERS:

In reporting on distemper it continues to be a many-sided problem, many of which are fundamental and require solution before real progress can be recorded. It is needless to detail an account of the disease. Much is being done with practically all its phases. Unfortunately the various efforts are apparently unrelated and little by way of confirmation is in evidence. Perhaps the clearest understanding exists regarding the symptoms of the disease and even here the question arises whether or not too much is crowded in on what might truly be distemper. The etiology of distemper is held as clear-cut—a virus of an admitted unknown quality. Others uphold the role of the bacterial flora present. The value of prophylactic and therapeutic agents, of antigenic and immune sera, does not rest on satisfactory data.

Apparently no work is sufficiently supported in any one place in America to warrant the hope that much will be accomplished within the near future.

It is essential that all with an interest in distemper assist in the centralization of knowledge and experimental efforts. This would reveal where the work deserving of encouragement is actually being done. When this is known, it should be possible to assist in supporting such work and the first requirement in this connection is a fund for the purpose.

There are many who can and will contribute to such a fund, which should be in control of the American Veterinary Medical Association. Such a fund could be used to encourage a cooperative research on distemper, to include the institutions and workers actually in a position to proceed with any one of the problems.

The Committee feels that the establishment of the machinery for the development of a distemper fund and the relation of the Committee's duties thereto is the first step in the consideration of one of the fundamentals of distemper.

(Signed) JOHN REICHEL, *Chairman.*
J. V. LACROIX
J. C. FLYNN
F. H. MILLER
W. J. LENTZ

PRESIDENT HILTY: What is your pleasure with this report?

DR. KINSLEY: I move the adoption of the report.

. . . The motion was seconded and carried. . . .

PRESIDENT HILTY: The next in order is the report of the Committee on Dairy Farm Inspection, Dr. L. A. Klein, Chairman.

DR. KLEIN: The Committee on Dairy Farm Inspection, as those of you who were at the meeting last year will probably recall, was appointed to outline a method or system of making a proper inspection of a dairy farm.

The Committee has drawn up such an outline, and I hold it here in my hand. But it consists of twelve pages of typewritten matter, including many details which I think the members of this Association would like to have an opportunity to consider very carefully. Since I do not believe it will be possible for you to give careful consideration to the matter in this report without a printed copy of it before you, I therefore am going to offer a motion that action on this report be deferred until next year, that the report be printed in the JOURNAL and that the Secretary be requested to have reprints of it at the meeting next year for distribution to the members.

. . . The motion was seconded by several. . . .

PRESIDENT HILTY: It has been moved and seconded that action on this report be deferred until next year, and that the Secretary be instructed to have reprints prepared.

. . . The question was called for, put to a vote and carried. . . .

REPORT OF SPECIAL COMMITTEE ON DAIRY FARM INSPECTION

MR. PRESIDENT AND MEMBERS:

The Committee on Dairy Farm Inspection was appointed to "draw up an outline of a proper system of dairy farm inspection." Such an outline has been prepared and is presented herewith for the consideration and approval of the members of the Association.

In preparing this outline, it has been the aim of the Committee to specify the various points which should receive attention in making a sanitary inspection of a dairy farm. It has also been the object of the Committee to avoid specifying any requirements as to equipment or methods, since these are matters which should be covered by law or regulations. No attempt has been made to indicate what action should be taken with reference to any undesirable condition which may be found, since this would depend to a great extent on the law or regulations under which the inspection is made.

The technic of the various operations included in the inspection of a dairy farm has not been described because it is assumed that any one qualified to inspect a dairy farm will be sufficiently informed in this respect.

The Committee recommends that 2000 copies of this report as adopted be printed for free distribution by the Secretary upon request.

(Signed) LOUIS A. KLEIN, *Chairman*.

(Signed) J. PAYNE LOWE

(Signed) F. D. HOLFORD

(Signed) C. W. EDDY

(Signed) J. P. BUSHONG

DAIRY FARM SANITARY INSPECTION

The sanitary inspection of a dairy farm should include everything associated with the production and care of the milk: cows, stable, milk-house, apparatus and equipment, and the methods in use. A medical examination of the personnel is also important, but this is the function of the physician. The various parts of a dairy farm sanitary inspection which should receive the attention of the veterinarian may be grouped in several divisions, as follows:

- I. Stable
 - 1. Exterior.
 - 2. Interior.
- II. Cows
 - 1. Cleanliness.
 - 2. Stage of lactation.
 - 3. Symptoms of disease.
- III. Stable Practices
 - 1. Cleaning the stable.
 - 2. Cleaning the cows.
 - 3. Milking.
 - 4. Feeding.
 - 5. Bedding.
- IV. Milk House
 - 1. Location.
 - 2. Construction.
 - 3. Apparatus.
 - 4. Water supply.

The inspection may begin with any one of these divisions, but it should not be considered complete until all have received attention. The features which should be considered in each division are discussed below under the appropriate heading.

I. Stable

1. Exterior: The external appearance and immediate surroundings of the stable should be examined with the purpose in view of obtaining information on the following points:

(a) *Type of stable:* (Bank barn with basement stable, or stable entirely above ground.) This will have to be taken into consideration in connection with the arrangements for ventilation and location of windows.

(b) *Exposure:* (The direction in which the windows and doors face.) The effect of this on the temperature, dryness and lighting of the interior should be considered.

(c) *Surroundings:* Attention should be given to the following:

1. Location of manure dump, especially with reference to the direction of the surface drainage and the source of the water supply. It should be noted whether the manure is stored on the ground or on a cement platform and inquiry should be made as to how frequently the manure is removed to the field, as these are important factors in controlling the breeding of flies.

2. Accessibility of the manure pile to the cows. It should be noted whether it is possible for the cows to walk about in the manure and nibble at the litter and thus become soiled with the manure and possibly ingest infected material. It should be observed whether the barnyard is sufficiently drained to cause it to dry out promptly after wet weather.

3. The location of surface privies, cesspools, and septic tanks, especially with reference to the direction of surface drainage and the source of the water supply, should be noted. They should be examined also for evidence of overflowing and to determine if they are properly screened against flies. The method of disposing of the household waste and the possibility of it contaminating the water supply should be investigated.

4. The toilet facilities provided for employees should be examined.

5. Other buildings in the immediate vicinity should be examined to learn the purpose for which they are used, to observe their sanitary condition, and to determine whether or not they furnish favorable conditions for breeding flies or generating offensive odors.

2. Interior: The inspection of the interior of the stable should include:

(a) *Ventilation:* Examine arrangements for ventilation; note number, location and size of inlets and outlets and determine if they are sufficient in number and not too large and not too far apart; determine total cross-sectional area of inlets and outlets to see if they are of sufficient capacity; see if they are provided with a convenient arrangement for opening and closing. Openings through the ceiling into the hay-loft should not be counted as outlets.

If the cows are in the stable and the windows and doors closed, note the odor of the stable air immediately on entering and examine the windows and walls for evidence of excessive moisture in the air. This is a good test of the efficiency of the ventilation system. The condition of the external atmosphere should be considered in this connection, however.

(b) *Cubic air space:* The length, width and height of the stable should be measured with a tape-measure or foot-rule to determine the cubic air space. The number of cubic feet of air space provided for each cow should be determined by dividing the total cubic area by the number of stanchions or stalls. Calculation should then be made to find out how many times an hour the air in the stable would have to be changed to provide each cow with the proper quantity of fresh air, since the presence or absence of draughts and the temperature of the stable air depends very largely upon the rate of air removal. Experience indicates that the minimum air space per cow necessary to provide satisfactory conditions is 500 to 600 cubic feet.

The distribution of the air space should also receive attention, because if the ceiling is too high the stable is likely to be cold at the level of the cows although quite warm at the upper levels. Following are the heights recommended: in a stable for 12 cows, not over 10 feet; for 30 cows, not over 12 to 15 feet; more than 30 cows, not over 16 feet.

(c) *Interior construction:* The material used in the construction of the ceiling, walls, floor, platforms, feed-trough, drop or gutter, and stall fittings should be noted and the state of repair and condition as to cleanliness observed. Further examination of these parts should be made as follows:

1. *Ceiling:* If hay or fodder is stored over the stable, or if there is a loft over the stable, the ceiling should be examined to see if it is tight and will not permit the dust to sift through. Observe the location of any openings which may be provided for removing hay or fodder from the loft to the stable. These should not be accepted as outlet flues. Note if the ceiling is clean, smooth, painted, oiled, plastered or whitewashed.

2. *Walls:* Examine the walls to see if they are smooth and clean, especially the walls in the rear of the cows.

3. *Floors:* Observe if they are smooth, free from fissures or depressions, impervious, graded to drain properly, and clean.

4. Platforms: Note the length and width with relation to the size of the cow. Examine the surface for fissures, depressions and similar conditions. Observe if they are impervious, graded to drain properly, and clean.

5. Feed-trough or manger: Observe if there is a separate manger for each cow, or one continuous trough for all the cows in the line, and if individual cups are provided for water. If the trough is continuous and no water-cups are present, ascertain if the cows are watered from the feed-trough or from a common trough in the barnyard. Examine for cleanliness and ascertain how frequently they are scrubbed.

6. Gutter or drop: Note the depth, width and slope of the gutter and observe if it contains sufficient litter to prevent splashing. Examine the bottom and sides for cracks and depressions.

7. Stall fittings: Note whether the surfaces are round or flat, examine for smoothness, and look for cracks or fissures.

8. Stanchions or ties: Examine to see if they are so designed that they may be expected to hold the cow in proper position on the platform without unnecessarily restricting movement.

9. Alleyway in rear of cows: Note if this is of sufficient width to permit the milk-pail to be carried without undue exposure to contamination.

(d) *Light*: Examine the windows to determine if they are sufficient in number and size and suitably located to light the stable properly; also examine them for cleanliness. Note the provisions for artificial lighting. All of the operations in a dairy stable can be performed better in light than in darkness. Light also exposes dirt, and sunlight is drying and germicidal. A dairy stable should be light enough to permit the reading of ordinary newsprint in those parts occupied by the rear ends of the cows.

II. Cows

1. *Examination for Cleanliness*: Look for dried manure, fresh manure, dust, dirt and exfoliations from the skin, especially on the flanks, thighs, udder, buttocks and tail. Note if any of these parts have been clipped to facilitate cleaning. Examine the hair-coat for indications of regular grooming.

2. *Stage of Lactation*: Examination and inquiry should be made regarding the stage of lactation with the view of discovering "strippers" near the end of lactation and fresh cows in the colostral stage. If a daily milk record is available, this should be studied.

3. *Examination for Symptoms of Disease*: This examination should be carried out in the following order:

(a) *Attitude*: Note the general appearance, carriage of the head, position of the ears, standing position, behavior (quiet or restless).

(b) *Skin and hair*: Examine the condition of the skin and hair and look for swellings, enlargements and irregularities of form.

(c) *Vulva, anus and tail*: These should be examined for evidence of discharges from the uterus, vagina, or digestive tract.

(d) *Respiration*: Determine the rate, rhythm, intensity, and character of the respiratory movements.

(e) *Udder*: Examine the udder by inspection. Make this examination when the udder is full, if possible. Compare the size and form of the different quarters; look for swelling, atrophy, abscesses, alterations of cow pox, etc.

(f) *Appetite*: Look in the manger for feed not eaten and note if the cow is ruminating.

(g) *Muzzle and nostrils*: Determine the degree of temperature and moisture of the muzzle. Examine the nostrils for pathological discharges.

(h) *Submaxillary and peripharyngeal regions*: Palpate the region of the submaxillary, parotid, retropharyngeal and atlantal lymph-glands.

(i) *Cough*: Test for cough. Note any coughing which occurs spontaneously in the stable and identify the cow concerned each time.

(j) *Lungs*: Examine the lungs by auscultation.

(k) *Prescapular and precrural lymph-glands*: Palpate the region of the prescapular glands. Palpate the precrural glands.

(l) *Complete the examination of the udder*: Inspect the skin of the udder and teats for abscesses, ulcers, symptoms of cow pox, etc. Inspect the open-

ing of the teat-canal for scabs and press the end of the teat to see if pus or mucus can be squeezed out of the teat-canal. Palpate the teat-canal, milk-cistern, and the gland tissue. Draw milk from each quarter and examine for color, consistency, flakes, clots, etc. Observe if there is any difficulty in expressing the milk and if the stream is split or deflected. Palpate the supra-mammary lymph-glands.

If the information obtained on this general examination is not sufficiently definite it will be necessary to make a further examination of certain parts or organs, apply tests indicated, or take specimens for laboratory examinations.

III. Stable Practices

1. Cleaning the Stable: Ascertain how often the manure is removed each day and what time elapses between the completion of this work and the beginning of milking; also how often are the platforms cleaned and the floor swept and how soon after the completion of this work is milking begun. Are the platforms and floor sprinkled before sweeping? How often are the stall fittings, window-sills and similar surfaces cleaned of dust? How often are the windows, walls and ceiling cleaned? Note if there are any collections of decaying organic matter present which may furnish breeding places for flies. Observe the kind of flies present.

2. Cleaning the Cows: Inquire how often the cows are cleaned, what methods are used, and how long before milking time the work is completed. Is the udder wiped with a damp cloth after being brushed clean, or is it washed, or washed and dried? What is the condition of the cloths or towels used for this purpose? How often are they washed? On how many cows is each cloth used before it is again washed? How often is the pail containing the water used for wiping or washing the udders refilled, i. e., how many udders are wiped or washed with a pail of water? What is the source of the water used for this purpose?

3. Methods of Milking: Note the general appearance of the milkers with regard to health and cleanliness. Observe if special clothing is worn while milking, its state of repair and condition as to cleanliness. Note what facilities are provided for washing and drying the hands and whether they are used by the milkers. Observe if the fore-milk is drawn and discarded and if milking is done with dry hands. See whether the pail is emptied as the milking of each cow is finished. Observe if the milk is emptied in the barn or is carried to a milk-house. Notice if there is a strainer on the receiving can or tank, of what it is composed, its condition, and if it is protected against flies. Note whether the milker in passing in the rear of the cows carries the pail in such a manner as to protect it from switching tails, splashing manure and urine, etc. Note what type of milk pail is used, and the condition as to state of repair and cleanliness.

4. Feeding: Ascertain when the cows are fed, with relation to milking time. Examine the feed as to its suitability, quality and condition as to soundness. Make inquiry in regard to the use of pastures, their condition in regard to garlic and other objectionable plants, drainage and water supply.

5. Bedding: Ascertain when the bedding is put down with relation to milking time, note material used, its condition as to soundness, and whether it is supplied in sufficient quantity.

IV. Milk-House

1. Location: Examine the location of the milk-house with reference to the proximity of much-used dirt roads or driveways or dusty fields and notice if it is entirely separated from the stable. If the milk-house is situated some distance from the stable, note if there is a milk-room convenient to but entirely separated from the stable, to which the milk-pails can be carried and emptied as the milking of each cow is completed. Search should be made for objectionable conditions which might have an undesirable effect on the milk.

2. Interior: The inspection of the interior of the milk-house should include the following:

(a) *Construction*: Note material used in construction and see if the walls, ceiling and doors are insulated against heat and cold; if the walls and ceilings are dust- and water-proof, if the doors are self-closing, and if fly-screens are provided for the doors and windows. Examine the floors to determine if they are constructed of non-absorbent material. Notice especially if the floors are tight or if there is any opportunity for liquids to leak through to the ground beneath; also observe if they are graded to drain properly. Attention should be given to the drainage provisions for carrying off waste material, washings, etc.

Notice if the size of the milk-house and the number of compartments are adequate to meet the requirements. If the milk is bottled, it should be noted if there is a separate room exclusively for this purpose and for holding the bottles between sterilizing and refilling; if the wash-room and boiler-room are separate from the rooms in which milk is handled; if the boiler is of sufficient size to provide the necessary steam for sterilizing the apparatus and containers, and if there is a convenient and adequate supply of hot and cold water.

(b) *Light*: Note if there are windows on opposite sides of the milk-house and if they are sufficient in area to allow sunshine to enter. Observe if they are so arranged that they may be opened when necessary in warm weather.

(c) *Ventilation*: On entering the milk-house take notice of the odor of the air and note the provisions for ventilation. While it is difficult to ventilate a milk-house or milk-room properly, because of the absence of heat, an outlet shaft extending through the roof with the windows used as inlets, or an opening in the ceiling with openings in opposite walls immediately under the roof, will afford sufficient circulation and ventilation.

(d) *Cleanliness*: Examine for cleanliness, and look to see if any material or apparatus is present which is not required for the proper handling of the milk.

3. Apparatus. Examine the condition of receiving tank and strainer and ascertain how strainers are cleaned and how often they are changed.

The walls of storage tanks and all surfaces with which milk comes in contact should be examined to see if they are clean, entirely covered with tin, smooth, and free from cracks or rust spots.

Examine all piping used to determine if it is of sanitary construction and ascertain if it is taken apart, properly cleaned and sterilized after each usage.

Attention should be given to the construction of the milk-vessels and utensils, their state of repair and condition as to cleanliness. Special notice should be taken of the pails, cans and strainers, it being observed particularly if the surfaces which come in contact with milk are entirely covered with tin or other suitable material, and if all seams are soldered flush. Note the type of pail used for milking; whether hooded or open. If hooded, examine seams and condition as to cleanliness underneath the hood. If milking machines are used, examine their construction from a sanitary standpoint, especially to see if they can be easily taken apart for cleaning.

Inquiry should be made as to how the vessels and utensils and other apparatus used for milk are cleansed and whether they are sterilized by steam or hot air and if not what substitute processes are used. The facilities provided for these purposes should be inspected and the efficiency of the washing powder determined. Note if sterilizer has recording or indicating thermometer attached.

Observe if suitable racks are provided for properly storing pails, cans and other utensils when not in use. Note the material used in the construction of the racks and their condition as to cleanliness and state of repair.

Examine the construction of the cooler or aerator to see if it can be readily cleaned and sterilized. Note if it is covered or is so located that milk passing over it will not be exposed to dust, dirt, or bad odors; also note its state of repair and condition as to cleanliness and ascertain how it is cared for after it is cleaned and sterilized until it is used. Take the temperature of the water used for cooling and also of the milk as it comes over the cooler. If natural ice is used, examine the ice-house to see if a sufficient supply is properly stored.

Examine the provisions for keeping the milk cool. If a refrigerator is used, take the temperature of the interior. If a cooling vat is used, examine the

construction to see if it is insulated. Observe if it is provided with a tight-fitting, insulated cover. Examine the interior as to cleanliness and take the temperature of the water in the vat. Notice if the water is deep enough to cover the cans to the neck and if it is clean and free from foreign matter.

If the milk is bottled on the farm, examine the facilities available for this work, noting especially whether an automatic bottle-filler and mechanical capper are used or whether the bottles are filled and capped by hand. Note if caps are supplied in bulk or in tubes and see if they are stored in a clean place. Whether the milk is iced after bottling and how it is cared for, should also receive attention.

4. Water Supply. Inspect the general surroundings of the source of the water supply, noting any possible sources of contamination. If a spring or dug well is the source of the water, notice if there is proper protection against surface drainage, and if any privies, cesspools or other possible sources of contamination are nearby. A sample of the water supply should be submitted to laboratory examination at intervals, even if it is from a deep well.

Sources of the ice supply should be investigated to make certain that the water is clean and free from contamination, and if artificial ice machines are used, the purity of the water also should be determined.

PRESIDENT HILTY: The next is the report of the Committee on Humane Society Hospitals, by Dr. R. S. MacKellar.

DR. MACKELLAR: Mr. President and Gentlemen: We will just make a short report at this time. For some time there have been numerous complaints as to the activities of humane societies operating animal hospitals and practicing veterinary medicine. This condition was brought to the attention of this Association, and President Hilty appointed a committee, consisting of myself, Dr. W. G. Hollingworth, of Utica, New York, and Dr. H. K. Miller, of New York City, to confer with a committee representing the American Humane Association, of which Mr. Sidney H. Coleman is president.

On July 10 a joint committee meeting was held in the headquarters of the A. S. P. C. A. in New York City. This conference was very satisfactory. We stated our side of the question to their committee, and our complaint was very favorably received, and we were given every consideration.

They assured us that they were willing to meet us more than halfway, and they asked our committee to draw up a code of ethics to govern the activities of humane associations, concerning these animal hospitals and veterinary practice by them, as well as the practicing veterinarian.

Gentlemen, I am not going to state very much more on this question. It seems best that it be left in the hands of the Committee, and we think we will obtain better results than by going into detail. We have every assurance that, at subsequent meetings to be held later in the year, we will obtain excellent results.

We are more than gratified by what has been accomplished so far. (Applause)

PRESIDENT HILTY: What is your pleasure with this report?

DR. J. W. CONNAWAY: I move it be adopted.

. . . . The motion was regularly seconded.

DR. MACKELLAR: Just one more word. If any veterinarians from large cities are interested in this subject and have something concrete to give the Committee, we will be glad to hear from them.

SECRETARY HOSKINS: I would like to add a word, Mr. President, to what Dr. MacKellar has said. In our correspondence with Mr. Coleman, president and general manager of the American Humane Association, he has made a request, and that is that this matter be not aired at all. Mr. Coleman knows that in several cases resolutions have been adopted at meetings of state associations, and that papers have been read on the subject. He has asked me if I would not do everything I could to keep the matter quiet until it is settled. He maintains, and I agree with him, that nothing can be gained at this time by giving our difficulties any further publicity.

DR. H. K. MILLER: Would it be possible for some of the men from California (I believe there was a resolution passed out there) to get together after this meeting and talk this thing over? I think the Committee should get a little more information from wider territory than we have in the East.

PRESIDENT HILTY: You have heard the motion on the adoption of this report. All in favor signify by saying "Aye"; contrary, "No." It is carried.

The next report will be that of the Committee on Standard Milk Control Code, to be read by Dr. Hoskins.

SECRETARY HOSKINS: This is a report of a brand new committee, a special committee appointed by our President during the year. It came about in this way: We have felt that the veterinary profession has been somewhat overlooked by the United States Public Health Service, particularly the Office of Milk Investigations, and that they were doing a great many things which were intimately connected with veterinary activities, and were not taking us into their confidence, or not calling upon us to consult with them as much as they should.

As the result of correspondence with Mr. Leslie C. Frank, sanitary engineer in charge of milk investigations, he extended a very insistent invitation that we, as an association, join with

the other organizations of an allied nature, in working out some of the problems in connection with milk inspection. So President Hilty appointed a special committee to work with Mr. Frank and the U. S. Public Health Service.

. . . Secretary Hoskins then read the report. . . .

REPORT OF COMMITTEE ON STANDARD MILK CONTROL ORDINANCE AND CODE FOR UNIFORM ENFORCEMENT

MR. PRESIDENT AND MEMBERS:

Your Chairman has been in communication with the various members of the Committee in an endeavor to secure material, sufficient to enable us to render a complete report at this session. There has been considerable correspondence and members of the Committee have given careful study to both the Standard Milk Control Code and to the Ordinance as prepared by the United States Public Health Service. Unfortunately it has not been possible to get the Committee together for a meeting. As a consequence, it does not seem advisable to attempt to render anything more than a progress report at this time.

Several members of the Committee have expressed themselves as being opposed to the Ordinance, on the ground that it would probably be impractical to secure uniform enforcement in the densely populated areas along the Atlantic Seaboard, where substantial efforts at milk control have been made.

A feeling has been expressed that the practical applications of the Ordinance would be impossible in this country, due to the wide range of climatic conditions, such as exist between the Mexican and Canadian borders.

Only one member of the Committee expressed himself as being prepared and willing to accept the Ordinance.

Aside from the general considerations of the Standard Milk Control Ordinance and Code for Enforcement, it appears that the Committee desires that special consideration be given to such matters as the dairy-barn, the cattle, the farm milk-house, and to the methods of handling milk.

The Committee on Dairy Farm Inspection of this Association will no doubt submit its report at this convention. The material furnished by this report will aid the Committee on the Standard Milk Ordinance.

It is understood that committees representing other organizations are preparing to submit tentative reports in the near future, which will deal directly with the Standard Milk Ordinance proposed.

Your Committee respectfully requests that it be continued, in order that the work assigned to it may be completed, and, further, that it be authorized to confer with the United States Public Health Service relative to any criticisms or suggestions which it may desire to offer.

GEO. W. GRIM, *Chairman.*

JOHN P. TURNER

E. D. KING, JR.

J. B. HOLLINGSWORTH

ROY F. LESLIE.

SECRETARY HOSKINS: The Standard Milk Control Code, which is referred to in this report, is a document consisting of over a hundred mimeographed pages. It is such an extensive affair that it will undoubtedly require a great deal of time before any final agreement can be arrived at relative to the many points covered in it.

I understand that the work is being divided, and the American Veterinary Medical Association is only one organization of about fifteen or twenty, that are cooperating, in an effort to formulate a standard milk control code that will be workable in and applicable to all parts of the United States.

DR. L. A. KLEIN: I move that this report be approved and that the Committee be continued.

. . . The motion was regularly seconded, put to a vote and carried. . . .

PRESIDENT HILTY: At this time we will have the report of the Committee on Intelligence and Education.

SECRETARY HOSKINS: You will recall that part one of this report, covering nominations for honorary membership, was made at the session yesterday afternoon.

. . . Secretary Hoskins then read the report. . . .

REPORT OF COMMITTEE ON INTELLIGENCE AND EDUCATION

MR. PRESIDENT AND MEMBERS:

PART I

The Committee on Intelligence and Education recommends that the following be elected to honorary membership in the American Veterinary Medical Association:

Dr. C. E. Gerhard Forssell, professor of surgery at the Veterinary High School, Stockholm, Sweden.

Prof. Naoshi Nitta, of Tokyo, Japan, eminent bacteriologist and distinguished scientist and editor of the *Journal of the Japanese Veterinary Society*.

Dr. Sven Wall, Stockholm, Sweden, professor and director of the State Veterinary-Bacteriological Institute.

PART II

The Committee recommends that the following veterinary colleges be placed on the accredited list for the year 1928-1929:

Alabama Polytechnic Institute, College of Veterinary Medicine.

Colorado Agricultural College, Division of Veterinary Medicine.

Georgia State College of Agriculture, Division of Veterinary Medicine.

Iowa State College, Division of Veterinary Medicine.

Kansas State Agricultural College, Division of Veterinary Medicine.

Michigan State College, Division of Veterinary Science.

Université de Montréal, L'Ecole de Médecine Vétérinaire.

New York State Veterinary College, Cornell University.

Ohio State University, College of Veterinary Medicine.

Ontario Veterinary College, University of Toronto.

University of Pennsylvania, School of Veterinary Medicine.

Texas Agricultural and Mechanical College, School of Veterinary Medicine.

State College of Washington, College of Veterinary Medicine.

PART III

The Committee was requested, at the time of the meeting in Philadelphia last year, by the Bureau of Education of the Department of Interior, to cooperate with them in making a survey of the veterinary colleges connected with the land-grant institutions in the United States. Suggestions for a questionnaire for submission to the veterinary colleges were given to the

Bureau of Education and all other assistance for which requests were made was rendered.

Information has been collected concerning the amount and type of instruction work given in connection with the curricula of agricultural students by the various departments of veterinary medicine in the colleges and universities in this country. This information will need further study before definite recommendations can be made concerning a uniform outline for teaching veterinary subjects to agricultural students. Realizing the importance of this function of the Committee, it is recommended that these studies be continued until some definite recommendations can be made.

Last year the Association referred to the Committee the question of a recommendation concerning changing the name "veterinarian." The Committee recommends that no change be made at the present time.

The data and records of this Committee are on file in the office of the Secretary-Editor of the Association.

Inasmuch as the adoption of the amendments to the Constitution and By-laws terminates the existence of this Committee, its members desire to extend to the Association their appreciation for the opportunity for service to the Association.

D. H. UDALL, *Chairman*.

(Signed) J. S. KOEN

(Signed) W. A. AXBY

(Signed) B. T. SIMMS

(Signed) H. PRESTON HOSKINS.

SECRETARY HOSKINS: It will be in order for the Association to act on the recommendation concerning honorary membership made yesterday afternoon. At that time the Committee recommended that the following be elected to honorary membership in the American Veterinary Medical Association:

Prof. C. E. Gerhard Forssell, Veterinary High School,
Stockholm, Sweden.

Dr. Sven Wall, State Veterinary-Bacteriological Institute,
Stockholm, Sweden.

Prof. Naoshi Nitta, Imperial University of Tokyo,
Tokyo, Japan.

PRESIDENT HILTY: What shall be done with this report?

DR. L. W. GOSS: I move the adoption of the report and the election of the honorary members.

PRESIDENT HILTY: It is moved that the report be adopted and that the men whose names were read be elected to honorary membership in this organization.

. . . The motion was seconded, put to a vote and carried.

PRESIDENT HILTY: Next we have the report of the Committee on Resolutions, Dr. C. A. Cary, Chairman.

DR. CARY: Gentlemen, the first resolution will require a little explanation before it is read. Some of you may not know that there has been an attack on the tuberculosis eradication system made by a United States Senator in Congress, largely against

the Bureau and the different states enforcing the law. It is an outgrowth of a difficulty between himself and the former state veterinarian of Virginia. He has been, as the negro said, pretty vigorous in his attack. There are some who don't like to have their names presented, for fear there will be some fight made about it.

This resolution was not written by me but is endorsed by the Committee and is presented to you for your action. It may or may not be vigorous enough for you. If it isn't, you can act on it accordingly.

. . . Dr. Cary then read the resolution. . . .

(Withdrawn. See modified resolution adopted at evening session.)

PRESIDENT HILTY: What is your pleasure with this resolution?

DR. WM. MOORE: Mr. President, I am rather in favor of this resolution, but I doubt the advisability of passing it as it is worded. I am not favoring Senator Glass at all, but I rather doubt the wisdom of passing this resolution. I would like to hear some discussion of it before it is passed.

DR. CARY: In order to bring it before the house for discussion, I move that this resolution be adopted.

DR. WM. MOORE: I will second it.

PRESIDENT HILTY: It has been moved and seconded that this resolution be adopted. Are there any remarks?

DR. H. K. WRIGHT: I am not entirely familiar with it, but the thought is: What is to be accomplished by the resolution? Will it do anything other than to stir up ill feelings? Will any good come out of the resolution? I would like to have somebody explain a little bit further what the actual object is.

DR. H. C. GIVENS: I doubt seriously the advisability of agitating this matter any farther. I question the good that may be derived by any one concerned, either this Association, the profession, the Bureau of Animal Industry, or anybody concerned. I doubt seriously the advisability of such a resolution being passed by the Association.

DR. C. H. HAYS: Is it not a fact that this has been published and has been circulated in the form of a pamphlet?

DR. CARY: This is attacking the action of this Association, a number of veterinarians and the Bureau of Animal Industry. Are you going to stand there and take it? Go ahead and take it if you want to.

DR. HAYS: This has been circulated extensively. It would seem that the wording of the resolution might be changed some-

what. As I get the purport, the resolution is against that being done.

DR. G. H. GLOVER: Mr. Chairman, I feel that we should not resolve respecting the intentions of a Congressman. I believe the resolution is not well drawn; it is not well worded. The intention is right, but I do not believe the wording is as it should be.

DR. B. J. KILLHAM: Mr. Chairman, having been confronted with this document in an important case in court, I am in favor of the attitude of the Committee, but I would move that the resolution be referred back to the Committee for reconstruction.

PRESIDENT HILTY: There is a motion before the house.

. . . The question was called for. . . .

PRESIDENT HILTY: The question is on the original motion. All in favor of the adoption of this resolution signify the same by saying "Aye"; contrary, "No." The motion is lost.

DR. KILLHAM: I move the resolution be referred back to the Committee for reconstruction.

. . . The motion was seconded by several, was put to a vote and carried. . . .

. . . Dr. Cary then read a resolution of thanks. . . .

RESOLUTION

WHEREAS, The American Veterinary Medical Association, in its sixty-fifth annual convention assembled in the great city of Minneapolis, Minnesota, has been so royally entertained, therefore, be it

Resolved, That this Association, individually and collectively, extend our heartfelt thanks and sincere appreciation to the Civic and Commerce Association for their untiring and effective efforts in making our sojourn within the City of Pure Water and the State of Sky-Blue Lakes most pleasant and agreeable;

That we thank the daily press for the generous and favorable publicity given our Association and members;

That we express our thanks to the management of the New Nicollet Hotel for the convention and entertainment rooms, and the generous efforts for our welfare and comfort;

That we thank the state, local and University veterinarians for the masterly and complete way in which they supplied all the arrangements for housing and entertaining the members, visitors and ladies, with a record-breaking attendance, and for the clinic at University Farm;

That we especially thank the Governor and the Lieutenant Governor for their welcome and for telling us of the many good things about the great state of Minnesota;

That we especially thank our old-time associate and member, Dr. C. E. Cotton, for being always present and continuously working to supply all our wants and making this meeting very successful.

Finally we desire to say that we are all pleased with Minneapolis and Minnesota, their people, and the land where the Father of Waters is born in the midst of eleven thousand sky-blue lakes, and—don't forget—we are coming back.

(Signed) C. A. CARY, *Chairman*.

(Signed) R. P. MARSTELLER

(Signed) W. F. CREWE

PRESIDENT HILTY: What is your pleasure with this resolution?

DR. KLEIN: I move the adoption.

. . . The motion was regularly seconded, put to a vote and carried. . . .

PRESIDENT HILTY: The next is the report of the Committee on Budget.

. . . Secretary Hoskins read the report. . . .

REPORT OF COMMITTEE ON BUDGET

MR. PRESIDENT AND MEMBERS:

The Committee on Budget recommends that the following amounts be appropriated for the purposes indicated:

President's contingent fund.....	\$ 500
Committee on Intelligence and Education.....	300
Committee on Legislation.....	1,000
Treasurer's contingent fund.....	300
Horse Association of America.....	50
Publicity work.....	500
Committee on Veterinary Biologics.....	300
Committee on Policy.....	300
Committee on History.....	100
Committee on Proprietary Pharmaceuticals.....	400
Committee on Program.....	300
Operating expenses of office of Association.....	9,000
Committee on Abortion.....	200

Total.....\$13,250

(Signed) REUBEN HILTY

(Signed) M. JACOB

(Signed) T. E. MUNCE

(Signed) H. PRESTON HOSKINS

PRESIDENT HILTY: What is your pleasure with the report of the Committee on Budget?

. . . Upon motion duly made, seconded and carried the report was adopted as read. . . .

PRESIDENT HILTY: Mr. Secretary, is there any unfinished business?

SECRETARY HOSKINS: None.

PRESIDENT HILTY: Is there any new business to come before the Association at this time?

DR. W. L. BOYD: Mr. President, with regard to the program, I would like to move that the Secretary be required, in the preparation of the program in the future, to determine before sending out the program as to whether or not those who are to participate are going to be present. If they are unable to be present it should be stated that the paper will be read by title.

DR. WM. MOORE: I second the motion.

PRESIDENT HILTY: It has been moved and seconded that the Secretary in the future be required to find out whether the

person writing a paper is to be at the meeting to deliver the paper himself; if not, it is to be listed in the program to be read by title only. Are there any remarks?

. . . The question was called for, put to a vote and carried.

PRESIDENT HILTY: Is there anything else?

DR. D. C. LOCHEAD: I am neither a member of your Association nor a member of your profession, the sister profession of medicine being my profession. I would urge very strongly that some kind of a resolution be passed by your body at this meeting in connection with the Senate Document No. 85, promulgated by Senator Glass. It is a very vicious document, in my opinion, and a document that is going to be used very largely and very extensively by the "antis" to the tuberculosis eradication program. It is a document of thirty-two pages, two-thirds of which is taken up with the recital of "The Tale of Two Heifers," with which possibly you are all acquainted, a personal matter which might very well have been handled differently by the state officials concerned.

The balance of the document is taken up largely with two matters, the first of which is the quotation of leading authorities in this country and in Europe to the effect that bovine tuberculosis is rarely, if ever, communicated to human beings, and then only in the presence of gross udder lesions.

The second contention is that cattle never die of tuberculosis. The leading authorities of the country are quoted as supporting those contentions. A man like the late lamented Dr. Schroeder, for instance, is said to have supported the contention that humans rarely suffer from bovine tuberculosis because tubercle bacilli are seldom excreted in the milk, and then only in the presence of gross udder lesions. Those of you who know the work of Dr. Schroeder will know he was not a man who minimized the menace of bovine tuberculosis to humans. That is a sample of the type of quotation that is carried out all through Senate Document No. 85.

It is already being used by the "antis," and I venture to say very few of the members of this Association have even seen it, but all the "antis" have seen it, and they are all going to use it. It has already been used in court cases.

I think it is very important, before the next session of Congress meets, that such a representative and influential body as this

should be on record as being opposed to the arguments that have been promulgated in that document. (Applause)

PRESIDENT HILTY: Thank you, sir, for your remarks.

Since there are absent from this meeting two of the members of the Committee on Resolutions, I will at this time appoint temporarily two men to take their places, Drs. B. J. Killham, of Michigan, and C. H. Case, of Ohio. Please get in touch with Dr. Cary.

We now stand adjourned.

. . . The meeting adjourned at 4:40 p. m. . . .

ADJOURNMENT

THURSDAY EVENING, August 9, 1928.

The fifth general session convened at 8:10 p. m., President Hilty presiding.

PRESIDENT HILTY: We have an unusual program for you this evening.

The first number is "Results of Research on the Diseases of Fur-Bearing Animals in Captivity," by Dr. R. G. Green, University of Minnesota, and Dr. J. E. Shillinger, Bureau of Biological Survey, U. S. Department of Agriculture, Washington, D. C. (Applause)

. . . Dr. Shillinger read the paper and Dr. R. G. Green made explanations concerning the illustrations, shown in the form of a moving-picture film. . . (To be published in the JOURNAL.)

PRESIDENT HILTY: The next paper is "Fecal Examination for Evidence of Parasitism in Domestic Animals (Illustrated)," by Dr. E. A. Benbrook, Iowa State College, Ames, Iowa.

. . . Dr. Benbrook read his paper and then showed a number of illustrations in the form of lantern-slides. . . (Applause.) (To be published in the JOURNAL.)

PRESIDENT HILTY: We are indeed fortunate this evening to have with us a man from the sister profession who is intensely interested in the same problems in which we are interested.

It gives me a great deal of pleasure to present to you at this time Dr. Charles H. Mayo, of the Mayo Clinic, Rochester, Minnesota, who will speak to you on "The Danger to Man of Bovine and Avian Tuberculosis." (Applause)

DR. CHARLES H. MAYO: Mr. Chairman and Members of this great Association: It is a nice thing to think so many have survived the invasion of the automobile. (Laughter)

I could not help but think, in looking over the program, how many papers there were that were devoted to research and investigation of disease. All over our country, each year that the legislatures meet, there are many people in each state who come to the fore to try and prevent research, so that bills come into the legislature to prevent the examination and study of disease in animals as well as in man.

Their major point is to prevent the investigation of disease of the human family. I just want to urge you to get interested as well, because usually those bills are very strict as drawn up. It is not even possible to examine a frog or a guinea pig or a mouse, because it is hurting some type of animal life, in the effort to prevent gross disease, destructive disease, not only to the human family but of animal life.

We are akin. You are interested in domestic animals and went into this work for a real love of those animals, to prevent diseases and, incidentally, to make a living while doing it, just the same as was said about your sister profession that I represent. One thing is you are not subject to the contamination that we are, that is, there are very few people trying to cure animal diseases with prayer, and as yet there has been no one strong enough to get out and try to push the vertebrae back in place when the hogs are dying of hog cholera. (Laughter) But I suppose children would be strong enough to do that in chickens with roup and pip, if it could be done.

We are subject to all kinds of contamination. I really believe it affects us. It is like the delightful old lady who went to see "What Price Glory" with her niece, and towards the end of the play, the niece noted that she was feeling around on the floor, and she said, "What is the matter? What are you trying to do?"

"Oh, I dropped my God damn glasses." (Laughter)

In investigation of disease, it is of interest to see the viewpoint of different people. Once a man of some repute makes a statement, he just thinks it is up to him to stick to it, right or wrong, the rest of his life. It is very difficult to get him to make any change, having once publicly made a statement. Nearly everyone who opposes him or believes differently, he calls an opponent of his.

I was once on a school board a number of years and watched the diseases of children as they went from grade to grade. We would see them in the clinic. We became interested some years ago, before we took up the testing of cattle for tuberculosis.

Gradually there was a lessening of glandular tuberculosis, but there were certain sections about the country where we got intestinal tuberculosis and glandular tuberculosis. Down around Mankato, in this state, we had many and many a case of children and young people that came in with glandular tuberculosis, intestinal tuberculosis, and peritoneal tuberculosis, developing secondarily to perforations from liquefaction of tuberculous mesenteric glands.

But today I am glad to state that our people have become awakened to the dangers of tuberculosis as transmitted through milk, not only of tuberculosis but many other things transmitted by milk. As I have often said, pasteurization may take the danger out of milk, but it does not make milk clean.

. . . Dr. Mayo then read his prepared paper. . . .
(Applause) (Published in September JOURNAL.)

DR. J. R. MOHLER: I move that a rising vote of thanks be extended to Dr. Mayo for his most important, highly instructive and very comprehensive paper on tuberculosis.

. . . The motion was seconded by several and carried. .

PRESIDENT HILTY: We have a couple of excellent papers on the program yet. The next paper is "Researches on Bacillus Calmette-Guérin: Experimental Vaccination Against Bovine Tuberculosis," by Dr. E. A. Watson, Chief Pathologist, Department of Agriculture, Ottawa, Canada. (Applause)

DR. WATSON: Mr. President, Ladies and Gentlemen: Anti-tuberculosis vaccination for many years has been a recurring hope, and up to the present time or, at least, until the present newly advocated method of vaccination has been decided upon, has been a recurring failure. It is therefore all the more surprising, at least to many of us on this continent, that until the newer method had been satisfactorily confirmed by animal experiments and substantiated by independent investigators, it should have become so extensively applied in countries in Europe, not only in cattle but also in humans. Up to the present time, 80,000 or 100,000 infants have been treated by this new method in the old countries before any definite conclusion has been arrived at as to its safety and value.

. . . Dr. Watson then read his prepared paper. . . .
(Applause) (To be published in the JOURNAL.)

DR. C. A. CARY: Mr. Chairman, I wish to report a resolution referred back to the Committee on Resolutions for revision.

. . . Dr. Cary then read the resolution. . . .

I could not help but think, in looking over the program, how many papers there were that were devoted to research and investigation of disease. All over our country, each year that the legislatures meet, there are many people in each state who come to the fore to try and prevent research, so that bills come into the legislature to prevent the examination and study of disease in animals as well as in man.

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DR. WATSON: Mr. President, Ladies and Gentlemen: Anti-tuberculosis vaccination for many years has been a recurring hope, and up to the present time or, at least, until the present newly advocated method of vaccination has been decided upon, has been a recurring failure. It is therefore all the more surprising, at least to many of us on this continent, that until the newer method had been satisfactorily confirmed by animal experiments and substantiated by independent investigators, it should have become so extensively applied in countries in Europe, not only in cattle but also in humans. Up to the present time, 80,000 or 100,000 infants have been treated by this new method in the old countries before any definite conclusion has been arrived at as to its safety and value.

. . . Dr. Watson then read his prepared paper. . . .
(Applause) (To be published in the JOURNAL.)

DR. C. A. CARY: Mr. Chairman, I wish to report a resolution referred back to the Committee on Resolutions for revision.

. . . Dr. Cary then read the resolution. . . .

RESOLUTION

WHEREAS, Senate Document No. 85 contains fragmentary or incomplete statements as to the seriousness of the menace of bovine tuberculosis to humans and also affirms that cattle rarely, if ever, die of tuberculosis, and

WHEREAS, The American Veterinary Medical Association in convention assembled recognizes that bovine tuberculosis is a serious menace to humans and that cattle would die of tuberculosis in considerable numbers if they were not slaughtered as soon as they show signs of falling off in condition or milk-production, therefore be it

Resolved, That we go on record as regretting the publication and circulation by the Government of such erroneous and misleading information, and be it further

Resolved, That a copy of this resolution shall be sent to each member of Congress by the Secretary of this Association.

(Signed) C. A. CARY, *Chairman*.

(Signed) W. F. CREWE

(Signed) R. P. MARSTELLER

(Signed) C. H. CASE

(Signed) B. J. KILLHAM.

DR. CARY: I move the adoption of this resolution.

DR. WM. MOORE: I second the motion.

PRESIDENT HILTY: It has been duly moved and seconded that this resolution be adopted as read. Are there any remarks?

. . . The question was called for, put to a vote and carried.

PRESIDENT HILTY: We have one short paper, with a picture following, that should be most interesting to us, "Coloration in Animals," by Dr. Seymour Hadwen, University of Saskatchewan. Following this paper will be the installation of officers for the next year.

. . . Dr. Hadwen gave an extemporaneous talk on "Coloration in Animals," illustrated with lantern-slides. . . . (Applause)

PRESIDENT HILTY: The Secretary has a very short report of the Executive Board.

SECRETARY HOSKINS: At a meeting of the Executive Board, after the session held this afternoon, the various recommendations made by President Hilty in his address were taken up, and a very thorough discussion ensued relative to the suggestion that a change be made in the method of selecting officers of the sections. The Executive Board recommends that Section 2 of Article 12 of the By-Laws be amended so as to provide for the appointment of all section officers by the President, rather than to have them elected as at present. This will serve as a notice that Section 2 of Article 12 is to be amended. As you know, no action can be taken at this time, as all amendments must be before the Association one year before final action.

PRESIDENT HILTY: What shall be done with this report?

DR. CARY: Mr. Chairman, I move this be referred to the Executive Board for action next year.

DR. WM. MOORE: I second the motion.

. . . The motion was put to a vote and carried. . . .

DR. C. H. STANGE: Mr. Chairman, there is one little item of business that we must take care of.

Your Executive Board recommends that the present Secretary be reappointed for the ensuing year at the same salary; that any necessary expenses that may be incurred in connection with moving be paid by the Association.

I move the adoption of the recommendation.

. . . The motion was seconded by several, put to a vote and carried. . . .

PRESIDENT HILTY: The next in order is the installation of the officers for the coming year. Is Dr. Munce in the room? I will appoint Dr. Patterson to escort Dr. Munce to the platform. Are any of the vice-presidents in the room? Dr. Hadwen, Dr. Axby and Dr. Norton are here.

. . . Dr. Patterson escorted President-Elect Munce to the platform. . . .

PRESIDENT HILTY: Dr. Munce, I don't know what in the world you are going to do to get publicity for yourself this year. As you know, Dr. Sigler tried to commit suicide three or four times in automobile accidents. I didn't think it was safe for me to do that. The only thing I could think of was to battle with a leopard. What you are going to do, I don't know, but it gives me a great deal of pleasure to turn this gavel over to you and install you as President for the next year. But before doing that I wish to say, Dr. Hadwen, it gives me a great deal of pleasure to install you as First Vice-President of this Association for the coming year. (Applause).

Dr. Munce, I only hope that you will have the thorough co-operation from this Association that I have had. (Applause)

. . . President Munce took the chair. . . .

PRESIDENT MUNCE: President Hilty, Members of the American Veterinary Medical Association: I appreciate more than I can tell you the great honor you have conferred upon me by electing me president of the American Veterinary Medical Association for the ensuing year. I accept the position and am willing to undertake the duties of the office and assume the responsibilities which are carried with it. . . .

I assure the membership that it shall be my purpose during the year to promote the work of our great Association to the end that it may function most efficiently and effectively, and thus be most helpful to the members of our honorable profession in the several branches of veterinary medicine, and that the influence for mutual good may be wide-spread in allied fields of endeavor.

I shall give my best efforts to assist in the development of a program for the constructive building of veterinary medicine. I appeal to all veterinarians and others interested in our honored profession for support in this undertaking. (Applause)

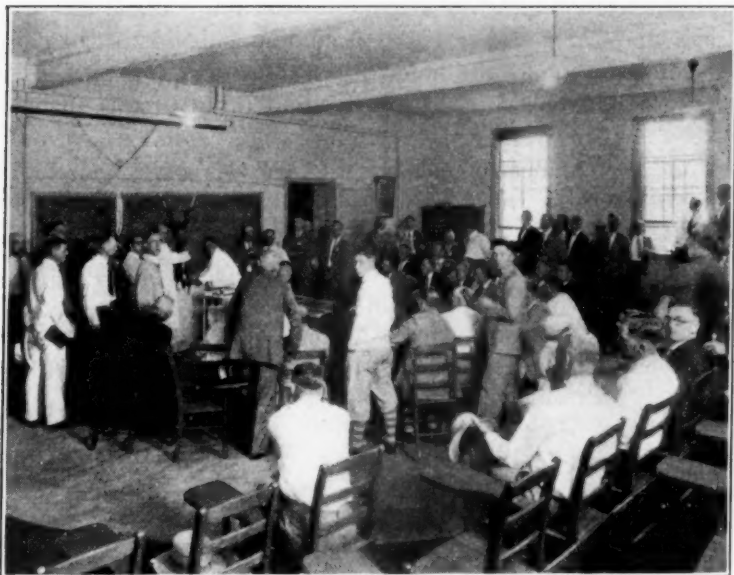
FIRST VICE-PRESIDENT HADWEN: I am very glad that I have so many good friends. Thank you very much. (Applause)

PRESIDENT MUNCE: Have any of the members of the Association anything to offer for the good and welfare of the Association? If not, then the Chair will entertain a motion to adjourn the meeting.

DR. WM. MOORE: I make the motion.

. . . The motion was regularly seconded and carried. The meeting adjourned at 11:35 p. m.

ADJOURNMENT



THE A. V. M. A. CLINIC AT UNIVERSITY FARM
Dr. J. C. Flynn demonstrating spaying operation.

JOURNAL OF THE American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

H. Preston Hoskins, Secretary-Editor, 716 Book Building, Detroit: Mich.

T. E. MUNCE, President, Harrisburg, Pa.

M. JACOB, Treasurer, Knoxville, Tenn.

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J. R. MOHLER, 4th District; C. H. STANGE, Chairman, 5th District;

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November, 1928

No. 7

STUDENT ENROLLMENT FOR 1928-1929

Reports received from the twelve recognized veterinary colleges in the United States and Canada reveal another healthy increase in student enrollment for the new college year. Figures supplied by the respective deans and compiled in this office show an increase of 158 students over last year. The grand total indicates that there are 917 students pursuing veterinary studies in the twelve colleges, as compared with 759 one year ago. Every one of the twelve colleges shows an increase in enrollment over last year. Some of these increases are rather small, while others are comparatively large. It will be noted that there is one less college this year than last, the University of Montreal having ceased to maintain a school of veterinary medicine.

The enrollment of 324 new students this year is very encouraging, being 79 more than one year ago. The number of sophomore students this year is 227, as compared with 189 last year. We find 185 juniors this year against 150 for the previous year. Senior students total 152, as against 143 last year. Our records show that, of the 143 seniors reported a year ago, 138 finished their courses and were graduated, rather a high percentage. One thing is quite evident, however, and that is that we can not expect a very great increase in the number of graduates in 1929 over 1928, in view of the fact that the present senior classes contain only 152 men all told.

There is a slight decrease in the number of graduate veterinary students this year, the number having dropped from 25 to 22. The number of special students remains the same. In this classification, we have placed all those students who are not definitely classified as belonging to any one of the four under-classes.

As far as the number of graduates is concerned, the year 1928 marks the turning point. Since 1918 there has been a gradual falling off in the number of new veterinarians added to our ranks through graduation each year. The number got to the low point in 1927, when 117 entered the profession through graduation, compared with 867 in 1918. Of course, it is impossible for anyone to state authoritatively just how many new veterinarians

Veterinary student enrollment for the college year 1928-1929

	FR.	SOPH.	JUN.	SEN.	SPEC.	GRAD.	TOTAL	1927-28	CHANGE
Alabama P. I....	9	2	11	4	0	0	26	16	+10
Colorado A. C....	31	21	15	5	0	0	72	55	+17
Cornell Univ....	47	36	23	28	0	4	138	112	+26
Georgia S. C....	20	9	3	2	0	0	34	16	+18
Iowa State Col....	55	37	30	20	0	6	148	113	+35
Kansas S. A. C....	30	17	16	16	2	2	83	74	+9
Michigan S. C....	5	4	8	12	0	6	35	34	+1
Montreal Univ....	C	L	O	S	E	D		17	-17
Ohio State U....	34	37	22	15	0	0	108	95	+13
Ontario V. C....	24	19	18	18	2	0	81	78	+3
Penna. Univ. of....	34	21	18	9	3	3	88	72	+16
Texas A. M. C....	7	5	2	3	0	1	18	9	+9
Washington S. C....	28	19	19	20	0	0	86	68	+18
Totals.....	324	227	185	152	7	22	917	759	+158

each year will be required to fill up the vacancies and new openings in the profession, but everybody seems to be pretty well agreed that the number of veterinary students, who have been pursuing their courses in our veterinary colleges during recent years, is entirely too low to meet the normal requirements. It will take a number of years to catch up with the losses of recent years and there need be no fears upon the part of these students now enrolled that there will not be good openings for them just as soon as they complete their courses.

During the past few months, we have had an unusually large number of inquiries from veterinarians looking for assistants. The supply of men available for these positions has been considerably short of the demand. Announcement is made, on another page of this issue of the JOURNAL, of the third civil-service exam-

ination to be held during the present calendar year to fill vacancies in the Bureau of Animal Industry. Three examinations were held for the same purpose during the year 1927. A few years ago, it was customary to hold about one examination each year. With new openings for veterinarians constantly being created and a general improvement in practice in nearly all parts of the country, we believe that the outlook for the profession was never brighter than at the present time.

MEMBERSHIP DIRECTORY

The new edition of the A. V. M. A. Membership Directory will be ready for distribution some time during the present month. It will present one feature which will be radically different from all previous editions of the Directory. Instead of the names of our members being listed in alphabetical order, regardless of their geographical location, the names will appear grouped by states, provinces, etc. Experience of the past five years has shown that there are just as many requests for state lists as there are for complete alphabetical lists.

As in previous editions of the Directory, there will be a complete list of the organization of the A. V. M. A. for the year 1928-1929, containing the names of all officers, the personnel of all standing and special committees and a complete list of our resident state, provincial, territorial and foreign corresponding secretaries. This list is being published almost concurrently in this number of the JOURNAL. President Munce is to be complimented upon the promptness with which he has made his appointments for the year. This is no small task and involves the writing of hundreds of letters by the President and Secretary.

The Directory will also contain the Constitution and By-Laws of the A. V. M. A. right up to date, with the various changes which were approved at the recent meeting in Minneapolis. Other features of the Directory include a complete list of the presidents, secretaries and treasurers from the beginning of the Association right down to date, as well as a complete list of all meetings that have been held, with dates and places. A copy of the Directory will be mailed to every member of the A. V. M. A. Extra copies will be placed on sale at the price of \$2.00 per copy. Each member should carefully preserve his own copy, as we will not be able to replace lost copies without making a charge for the same. The names of all members whose applications were completed up

to November 1, 1928, appear in the list of active members. Prospective members who have applications pending are listed in a separate section, as well as a list of the student chapters of the A. V. M. A. located in the various veterinary colleges in the United States and Canada.

EXECUTIVE BOARD CHANGES

Following his election to the presidency of the A. V. M. A., at the Minneapolis meeting, Dr. T. E. Munce resigned as a member of the Executive Board, representing District No. 2. Exercising the executive prerogatives prescribed in Section 9, of Article V, of the Constitution, Dr. Munce has filled the vacancy by appointing Dr. E. P. Althouse, of Sunbury, Pa., as his successor. Dr. Althouse will hold office until a special election can be held in District No. 2, for the purpose of filling the vacancy. Dr. Munce was re-elected a member of the Executive Board for



DR. E. P. ALTHOUSE

District No. 2 this year and his term of office would not have expired until the close of the annual convention to be held in 1933. Therefore, the member who is elected to fill the vacancy will serve for the term which will expire in 1933. All members of the A. V. M. A. in good standing, located in District No. 2, will have the privilege of participating in the election of a member to represent them on the Executive Board. The special election will be held by mail ballot and the rules for regular elections will prevail.

Dr. Althouse has been a member of the A. V. M. A. for twentyfive years, having joined the year of his graduation from the University of Pennsylvania in 1903. He has served as secretary of the Section on General Practice since 1926, having been elected at the Lexington meeting.

Dr. C. H. Stange, who represents District No. 5 on the Executive Board, was elected chairman of the Board at the final session of the Board held in Minneapolis.



DR. C. H. STANGE
Chairman of the Executive Board

APPLICATIONS FOR MEMBERSHIP

(See May, 1928, JOURNAL)

FIRST LISTING

- AUSTIN, EDWIN MUNROE 451 Ulysses St., Los Angeles, Calif.
D. V. M., Iowa State College, 1918
Vouchers: W. L. Curtis and Kenneth G. McKay.
- BEARD, THOMAS GEORGE 3684 Beverly Blvd., Los Angeles, Calif.
D. V. M., Colorado Agricultural College, 1927
Vouchers: W. L. Curtis and Kenneth G. McKay.
- BELL, RALPH M. 2116 E. Colorado St., Pasadena, Calif.
D. V. M., Cornell University, 1909
Vouchers: W. L. Curtis and John L. Tyler.
- BERGMAN, ROY EDWIN Cassopolis, Mich.
D. V. M., Michigan State College, 1921
Vouchers: Edw. K. Sales and Ward Giltner.
- BIRCH, ALFRED L., 203 Administration Bldg., Union Stock Yds., Los Angeles, Calif.
D. V. M., Iowa State College, 1921
Vouchers: W. L. Curtis and Kenneth G. McKay.
- BOWERS, JOSEPH M., 4411 Lucerne St., Bellevue, R.F.D. No. 7, Pittsburgh, Pa.
D. V. M., Colorado Agricultural College, 1925
Vouchers: L. D. Barrett and Samuel E. Young.
- BRUNSON, ROBERT A. Corona, Calif.
D. V. M., Kansas State Agricultural College, 1928
Vouchers: W. L. Curtis and John L. Tyler.
- BRYANS, JOSEPH W. 560 7th St., San Diego, Calif.
V. S., Ontario Veterinary College, 1907
Vouchers: W. L. Curtis and Kenneth G. McKay.

- CLARK, HOLLIS HAMMOND Perry, Mich.
D. V. M., Michigan State College, 1927
Vouchers: Ward Giltner and B. J. Killham.
- CLEVELAND, W. J. 986 E. Center St., Bellflower, Calif.
D. V. M., Iowa State College, 1910
Vouchers: W. L. Curtis and Kenneth G. McKay.
- COAD, JOSEPH A. 609 Minaflores St., San Pedro, Calif.
B. V. S., Ontario Veterinary College, 1923
Vouchers: W. L. Curtis and Kenneth G. McKay.
- COULTER, TRACY J. 1771 N. Highland Ave., Los Angeles, Calif.
B. V. S., Ontario Veterinary College, 1921
Vouchers: W. L. Curtis and Kenneth G. McKay.
- DAVIDSON, F. N. 1837 N. Euclid, Ontario, Calif.
M. D. C., Chicago Veterinary College, 1907
Vouchers: W. L. Curtis and John L. Tyler.
- FAUSSET, J. K. Spiceland, Ind.
D. V. M., Indiana Veterinary College, 1917
Vouchers: Frank H. Brown and C. T. Howard.
- FERGUSON, A. T. 5866 S. Main St., Los Angeles, Calif.
D. V. M., Cornell University, 1908
Vouchers: W. L. Curtis and Kenneth G. McKay.
- GLENN, SAMUEL 117 S. Negley Ave. E. E., Pittsburgh, Pa.
D. V. M., Cornell University, 1921
Vouchers: V. A. Moore and S. E. Young.
- GREENING, W. L. 909 W. Anaheim St., Long Beach, Calif.
D. V. M., McKillip Veterinary College, 1913
Vouchers: W. L. Curtis and Kenneth G. McKay.
- HAPENNEY, JAMES E. 5258 W. Pico St., Los Angeles, Calif.
D. V. M., Chicago Veterinary College, 1918
Vouchers: W. L. Curtis and Kenneth G. McKay.
- HICKEY, DANIEL J. 618 Roosevelt Ave., Salt Lake City, Utah.
D. V. S., U. S. College of Veterinary Surgeons, 1910
Vouchers: F. E. Murray and E. P. Durham.
- HULL, FREDERICK T. 1004 N. Fresno St., Fresno, Calif.
M. D. V., McKillip Veterinary College, 1909
Vouchers: Stephen O'Toole and A. C. Rosenberger.
- IMMENSCHUH, ALDIE PHILIP Santee, Calif.
D. V. S., Kansas State Agricultural College, 1914
Vouchers: W. L. Curtis and Kenneth G. McKay.
- JAMESON, EDWARD F. 3005 Lothrop St., Detroit, Mich.
D. V. M., Kansas City Veterinary College, 1906
Vouchers: Melvin A. Ruck and Ashley G. Stamp.
- KNIGHTON, L. K. 3438 Mt. View Drive, San Diego, Calif.
D. V. M., Ohio State University, 1911
Vouchers: W. L. Curtis and Kenneth G. McKay.
- KOHN, WILLIAM BERNARD 6526 North 17th St., Philadelphia Pa.
V. M. D., University of Pennsylvania, 1918
Vouchers: Fred Boerner and Malcolm J. Harkins.
- MATHEW, FLOYD A. 2816 E. Anaheim St., Long Beach, Calif.
D. V. M., Ohio State University, 1925
Vouchers: W. L. Curtis and Kenneth G. McKay.
- MEYER, DONALD BLAIRE East Lansing, Mich.
D. V. M., Michigan State College, 1927
Vouchers: E. T. Hallman and B. J. Killham.
- MILLER, G. N. 228 E. Corina Blvd., Covina, Calif.
D. V. M., San Francisco Veterinary College, 1915
Vouchers: W. L. Curtis and John L. Tyler.

- NEER, LESTER COOK 324 Edgar Ave., Dayton, Ohio.
D. V. M., Ohio State University, 1919
Vouchers: David S. White and Jas. D. Grossman.
- O'HARRA, GUY L. General Delivery, Modesto, Calif.
D. V. M., Kansas City Veterinary College, 1918
Vouchers: Harry E. Van Tuyl and W. L. Curtis.
- PULLIN, J. H. 1806 N. Broadway, Santa Ana, Calif.
D. V. S., San Francisco Veterinary College, 1910
Vouchers: W. L. Curtis and Kenneth G. McKay.
- RAWLINGS, WARREN B. Swiftwater, Pa.
V. M. D., University of Pennsylvania, 1928
Vouchers: E. T. Booth and G. A. Dick.
- RING, WILLIAM CHARLES Auckland, New Zealand.
V. M. D., University of Pennsylvania, 1911
Vouchers: M. F. Barnes and T. E. Munce.
- ROCKEY, WILLIAM H. 121 East E., Ontario, Calif.
M. D. C., Chicago Veterinary College, 1909
Vouchers: W. L. Curtis and John L. Tyler.
- SPARKS, ERNEST R. 764 W. First St., Pomona, Calif.
D. V. S., Kansas City Veterinary College, 1909
Vouchers: W. L. Curtis and John L. Tyler.
- SPRINGER, GEO. E. Ashtabula, Ohio.
D. V. M., Ohio State University, 1915
Vouchers: Davis S. White and Jas. D. Grossman.
- SPRINGER, RALPH R. Rt. Box 357B, Indianapolis, Ind.
D. V. M., Indiana College, 1916
Vouchers: C. A. Clawson and Benj. H. Yenner.
- TOBIN, HERMAN ALBERT Three Rivers, Mich.
D. V. M., McKillip Veterinary College, 1909
Vouchers: Edw. K. Sales and W. N. Armstrong.
- WEST, T. E. 4234 Euclid Ave., San Diego, Calif.
D. V. M., Chicago Veterinary College, 1914
Vouchers: W. L. Curtis and Kenneth G. McKay.
- WINTER, L. A. Eau Claire, Mich.
D. V. M., Indiana Veterinary College, 1911
Vouchers: E. L. Krieger and F. O. Bray.
- YOUNG, OLIVER K. 947 Clinton St., Noblesville, Ind.
D. V. M., Indiana Veterinary College, 1917
Vouchers: R. A. Miller and Frank H. Brown.

Applications Pending

SECOND LISTING

- Carroll, Floyd Eugene, Box 251, Faculty Exchange, Texas A. & M. College,
College Station, Texas.
- Conrad, H. P., R. R. 3, Port Huron, Mich.
- Gwaltney, John S., 14 Willow St., Potsdam, N. Y.
- Heacock, C. C., Rapid City, S. Dak.
- Isham, Russell R., 124 Auburn Ave., Auburn, Wash.
- Kelly, Patrick J., 8626 12th St., Detroit, Mich.
- LaRue, Irving G., Dept. of Agriculture, Sacramento, Calif.
- Thomas, Owen Ellis, Willard, Ohio.
- Thoreson, M., Mayville, N. Dak.
- Turla, Faustino F., 169 Nagtahan, Manila, P. I.

The amount which shall accompany an application filed this month is \$5.83, which covers membership fee and dues to January 1, 1929, including subscription to the JOURNAL. It is suggested that applications filed this month be accompanied by remittance for \$10.83, the additional \$5.00 being for the 1929 dues.

COMING VETERINARY MEETINGS

- Connecticut Veterinary Medical Association. Danbury, Conn., November 7, 1928. Dr. E. H. Patchen, Secretary, Milford, Conn.
- San Diego-Imperial Valley Medical Association. San Diego, Calif. November 7, 1928. Dr. W. G. Oliver, Secretary, 3821 Arizona St., San Diego, Calif.
- New York City, Veterinary Medical Association of. Academy of Medicine. Fifth Avenue and 103rd St., New York, N. Y. Dr. C. P. Zepp, Secretary, 128 W. 53rd St., New York, N. Y.
- Chicago Veterinary Society. Great Northern Hotel, Chicago, Ill. November 13, 1928. Dr. J. B. Jaffray, Secretary, 2956 Washington Blvd., Chicago, Ill.
- Southeastern Michigan Veterinary Medical Association. Detroit, Mich. November 14, 1928. Dr. H. Preston Hoskins, Secretary, 716 Book Bldg., Detroit, Mich.
- Hudson Valley Veterinary Medical Society. Poughkeepsie, N. Y. November 14, 1928. Dr. J. G. Wills, Secretary, 122 State St., Albany, N. Y.
- Missouri Valley Veterinary Association. Kansas City, Mo. November 20-22, 1928. Dr. E. R. Steel, Secretary, 8023 Wornall Rd., Kansas City, Mo.
- Kansas City Association of Veterinarians. New Baltimore Hotel, Kansas City, Mo. November 20, 1928. Dr. J. D. Ray, Secretary, 400 New Centre Bldg., Kansas City, Mo.
- Southern California Veterinary Medical Association. Chamber of Commerce Bldg., Los Angeles, Calif. November 21, 1928. Dr. W. L. Curtis, Secretary, 1264 W. 2nd St., Los Angeles, Calif.
- Illinois State Veterinary Medical Association. Chicago, Ill. December 3-4, 1928. Dr. W. H. Welch, Secretary, Lexington, Ill.
- National Association of B. A. I. Veterinarians. La Salle Hotel, Chicago, Ill. December 5-7, 1928. Dr. J. S. Grove, Secretary, 1715 Belmont Ave., Fort Worth, Texas.
- United States Live Stock Sanitary Association. La Salle Hotel, Chicago, Ill. December 5-7, 1928. Dr. O. E. Dyson, Secretary, 45 Live Stock Exchange Bldg., Wichita, Kans.
- Nebraska State Veterinary Medical Association. Omaha, Nebr. December 11-12, 1928. Dr. George A. Young, Secretary, Syracuse, Nebr.

RESEARCHES ON BACILLUS-CALMETTE-GUERIN AND EXPERIMENTAL VACCINATION AGAINST BOVINE TUBERCULOSIS*

By E. A. WATSON

*In collaboration with C. W. McINTOSH and H. KONST
Dominion of Canada, Department of Agriculture, Research
Laboratories, Hull, Quebec*

In 1924, Professors Calmette and Guérin, of the Institute Pasteur, France, announced a new method for the prophylactic immunization of cattle against tuberculosis. This method, briefly, is the administration to the new born of a living culture of tubercle bacilli, which it is claimed has been completely deprived of virulence through a long series of artificial cultivations upon a particular medium. "Vaccination by our bacillus B. C. G.," so it is stated, "is inoffensive, not only for young bovines and for adult cattle free from tuberculosis, but also for all species of animals susceptible to infection by the tubercle bacillus. This bacillus is completely deprived of virulence. It has lost all aptitude of provoking the formation of tubercles . . ."

The authors' reputation, their frankness and their clear exposure of their hypotheses and of the protocols of their experiments justified an immediate investigation and research.

The claims made were obviously of great practical importance and, if they could be substantiated and confirmed, anti-tuberculosis vaccination, according to the method of Calmette and Guérin would, doubtless, be introduced and generally applied as one of the chief means of safeguarding cattle against the disease.

The question, reduced to its simplest form, is: Is it safe; is it efficient? But this question carries with it a great many contributory questions and it requires a vast amount of experimental research before it can be definitely answered. As to safety, we mean: Is it harmless, truly non-pathogenic and entirely without danger to the animal treated with it? Are the animals receiving B. C. G. vaccine, both before and after subsequent exposure to natural infection, harmless and without danger to those with which they come in contact, directly or indirectly?

*Presented at the sixty-fifth annual meeting of the American Veterinary Medical Association, Minneapolis, Minn., August 7-10, 1928.

Is the claimed innocuity of B. C. G. a fixed character or just a lowered degree of virulence which may again ascend under either natural conditions or in the course of artificial cultivation? What is the ultimate fate of the vaccinating bacilli and what further modification may take place, especially with regard to restoration of virulence, after a long sojourn in the animal body or after passage from animal to animal?

As to efficiency, does it increase resistance and, if so, to what extent or degree? Does it actually prevent subsequent infection with virulent tubercle bacilli, or does it enable an animal to tolerate such an infection without any harmful result? Does it actually prevent tuberculosis?

Such is the problem, according to our conception of it, upon which we have continued to work since 1924.

I. Bacillus-Calmette-Guerin and the Question of Virulence

It is said that: (a) the origin of Bacillus-Calmette-Guérin is a very virulent strain of the bovine type; (b) after successive cultivations upon a glycerinated bile medium commencing January 8, 1908, and transplanting about every fifteen days, the bacillus after four years was no longer virulent for cattle but still retained its virulence for the horse; and (c) after thirteen years of successive cultures upon bile-potato medium it had become attenuated to the extent that it had completely lost its virulence for all species of animals but, nevertheless, retained its tuberculin-producing properties and its power of sensitizing animals to react to the ordinary tuberculin tests.

Two sample B. C. G. cultures were very kindly given to us by Professors Calmette and Guérin for research purposes. One, hereinafter referred to as "B. C. G. (80)," was forwarded direct to Ottawa from the Institute Pasteur, Lille; the other, "B. C. G. (17)," was personally handed to me by Professor Calmette at the Institute Pasteur, Paris. These two original cultures we have carried through successive generations, always keeping them distinct and separate and, from time to time, have made upon guinea pigs pathogenicity experiments with vaccine suspensions prepared for the prophylactic treatment of new-born calves.

B. C. G. PATHOGENICITY EXPERIMENTS

Experiment 1, January 20, 1925:

Sixteen guinea pigs were inoculated with B. C. G. (80), suspension A; four pairs subcutaneously and four pairs intra-

peritoneally, the dose of bacilli being 0.5, 1.0, 2.0, and 5.0 mgs., moist weight, for each pair. Two rabbits also were inoculated, intravenously, one with 1.0 mg. and the other with 5.0 mgs. of bacilli. The results in some cases were interfered with by deaths attributed to pneumonia. The first death occurred on the sixth day after inoculation and the last on the 542nd day—the end of the period of observation.

Nine of the sixteen inoculated guinea pigs, in the course of five to eighteen months, developed generalized tuberculosis, which apparently was the cause of death in six of them, and would probably have caused death in the three others had they not been destroyed.

Seven guinea pigs died from causes other than tuberculosis and in six of these there was no discernible tuberculous lesion.

The two rabbits died on the 114th and 115th days, from unknown causes, one showing slight tuberculous lesions in the lung, the other no trace of a tuberculous lesion.

It is of interest to note that the two guinea pigs which survived the longest, approximately eighteen months, died, one from tuberculosis, and the other from an unknown cause, but free from visible tuberculosis.

Experiments 2, 3 and 4, March 11, May 13, and July 15, 1925:

Eight guinea pigs were inoculated subcutaneously and one rabbit intravenously, each receiving 1.0 mg. of B. C. G. (80), moist weight (suspensions B, C and D). All died from enzootic pneumonia between the 12th and 123rd days after inoculation. Only one guinea pig showed slight tuberculous lesions of the spleen and mesenteric lymph-glands, the remainder, as well as the rabbit, died without visible tuberculous lesion.

Experiment 5, December 24, 1925:

Twenty-eight guinea pigs were inoculated with doses of B. C. G. (80) varying between 0.5 and 5.0 mgs., moist weight (suspension E). Three rabbits received intravenously 1.0, 2.0, and 5.0 mgs., respectively. The total duration of the experiment was 447 days. The first death occurred on the 78th day, from pneumonia, and this guinea pig showed slight tuberculous lesions of the liver and of the mesenteric, sublumbar and axillary lymph-glands, with acid-fast bacilli present. Three more guinea pigs died from causes other than tuberculosis, on the 186th, 231st and 338th days after inoculation without visible tuberculous lesion.

The remaining twenty-four animals were killed, three after an observation period of five to six months and twenty-one after a period of twelve to fourteen months. In three guinea pigs apparently tuberculous lesions of very slight extent were visible in the liver and spleen. The others, and the rabbits, were entirely negative.

None of the animals in this experiment died from tuberculosis and in only four were very slight tuberculous lesions found, apparently non-progressive, possibly retrogressive.

Experiment 6, June 28, 1926:

Two guinea pigs were inoculated with 2.0-mg. doses of B. C. G. (80), moist weight (suspension G), one subcutaneously and the other intraperitoneally.

Both animals died from causes other than tuberculosis at the end of three months and were free from visible tuberculous lesions.

Experiments 7 and 8, August 27, 1926:

Twenty guinea pigs were inoculated with 2.0-mg. doses of B. C. G. (80), suspensions H and I, ten subcutaneously and ten intraperitoneally. The period of observation was one year.

Of those inoculated subcutaneously, two died from causes other than tuberculosis during the ninth month of observation and the eight remaining were destroyed after a period of one year. A tuberculous lesion was found in the cervical gland of one of these guinea pigs and in the axillary and inguinal lymph-glands of another guinea pig. In the remainder no tuberculous lesion could be found.

Of those inoculated intraperitoneally, one died on the 37th day with tuberculous lesions in the liver, spleen, mesenteric and inguinal lymph-glands and three died during the ninth month of observation. The remainder were destroyed after one year. Every animal in this group showed mesenteric tuberculous lesions, in some of which acid-fast bacilli could be demonstrated. No other lesions were found except in one animal destroyed on the 372nd day, in which the lungs and bronchial glands were found tuberculous.

Experiment 9, August 27, 1926:

Twenty guinea pigs were inoculated with 2.0-mg. doses of B. C. G. (80), suspension J, ten subcutaneously and ten intraperitoneally. The period of observation was extended in some cases to eighteen months.

Of those inoculated subcutaneously, one guinea pig, dead on the 49th day from an unknown cause, showed suspicious tuberculous lesions in the liver and spleen. The remainder showed no visible tuberculous lesion.

Of those inoculated intraperitoneally, eight showed tuberculous lesions of the mesenteric lymph-glands and one of these, dead on the 354th day, showed additional lesions of the spleen and bronchial lymph-glands, with acid-fast bacilli present.

Two guinea pigs, destroyed after one year and eighteen months, were entirely negative.

Experiment 10, December 16, 1926:

Two guinea pigs, two rabbits and five chickens were inoculated with B. C. G. (80), suspension M. The guinea pigs and rabbits were destroyed on the 243rd day after inoculation, with entirely negative results, and the chickens likewise.

Experiment 11, October 14, 1926:

Twenty guinea pigs were inoculated, ten subcutaneously and ten intraperitoneally, with 2.0-mg. doses of B. C. G. (17), suspension K. One guinea pig died from pneumonia on the 71st day, and showed suspicious lesions in the spleen. The nineteen other guinea pigs were killed after an observation period of one year and ten days, and in not a single case was there evidence of a tuberculous lesion.

Experiment 12, November 5, 1926:

Five guinea pigs were inoculated with B. C. G. (17), suspension L. One was destroyed on the 159th, two on the 286th, and two on the 462nd days after inoculation, and in none was there found any evidence or suspicion of tuberculous lesion.

Experiments 13 and 14, April 13 and April 19, 1927:

Four guinea pigs were inoculated with B. C. G. (17), suspension N, in doses of 10.0 to 20.0 mgs., and three guinea pigs with B. C. G. (17), suspension O, in 5.0-mg. doses. One guinea pig died on the 23rd day from an unknown cause and showed slight tuberculous lesion in the liver and in the mesenteric, axillary and inguinal lymph-glands. The six remaining guinea pigs, died or destroyed at the ninth to twelfth months of observation, were free from tuberculous lesions.

Experiment 15, May 9, 1927:

Six guinea pigs were inoculated subcutaneously with B. C. G. (17), suspension P, receiving 6.5 mgs. One guinea pig died from

extensive generalized tuberculosis on the 335th day. One, destroyed on the 342nd day, showed advanced generalized tuberculosis; another, destroyed the same day, only slight tuberculous lesions, limited to the mesenteric, cervical and axillary lymph-glands. One, destroyed on the 280th day, showed moderately extensive tuberculous lesions. The two remaining guinea pigs were entirely negative.

SUMMARY OF PATHOGENICITY TESTS

Summing up the experimental results thus obtained from 134 guinea-pig pathogenicity tests, made at different times and with different preparations of B. C. G. vaccine, we find 92 of the inoculated animals (68%) without any visible lesion or trace of tuberculous infection; but 30 (22.3%) with tuberculous lesions which in some cases may have been arrested and undergoing absorption but in others appearing suspiciously active; and 12 (9%) with extensive caseating generalized tuberculosis. In the six guinea pigs which died from tuberculosis in the first experiment (B. C. G. (80), suspension A), the shortest duration was five months, the longest eighteen months, and the average ten to eleven months.

Only five rabbits were inoculated and a few tubercles were found in the lung of one of these.

It appears, therefore, that our B. C. G. cultures possessed a low degree of virulence in that they caused, in addition to more or less localized and questionably benign lesions in about 22 per cent, generalized, typical tuberculosis in about 9 per cent of the inoculated guinea pigs after a relatively long period of infection.

The virulence, however, was exalted by further serial guinea-pig passage; and, as now carried from guinea pig to guinea pig, B. C. G. strains originating from vaccine suspensions A, H, I, and P, cause typical tuberculosis and death.

DISCUSSION

We are aware that these findings are in serious disaccord with those of Professors Calmette and Guérin and their collaborators, and with others who have affirmed that B. C. G. has been completely deprived of virulence, is not re-inoculable from animal to animal, is incapable of causing tuberculosis and is absolutely inoffensive and harmless. Our experimental results at the end of the first year (1926) were in conflict with the claimed inno-
cuity of B. C. G. We thought it wise, however, to delay publica-

tion and repeat the experiments as often as necessary to establish unquestionable evidence. We continued for another two years and are still continuing these pathogenicity and virulence tests.

The results of one series of experiments would sometimes appear to be more or less in conflict with those of another series. After three and one-half years of experimental research on this question of virulence, we believe we are warranted in publishing the results, and we are not alone in questioning the proclaimed innocuity of B. C. G. Views and theories upon the degree of attenuation and virulence of B. C. G. and its mode of action have undergone considerable modification within the past year or two. It was at first suggested that the vaccine, when introduced into an animal subcutaneously, caused only a local focus of infection and exerted its action and immunizing effects from such a local focus. Now it is admitted that the inoculation of B. C. G. results in a bacillary invasion of the lymphatic system, causing a general reaction and hypertrophy of the lymphatic glands, and may even cause true tubercles in the lymph-glands, liver, spleen and mesentery. Nevertheless, it is still claimed that this is only a benign infection, that such lesions are not re-inoculable into guinea pigs, that they spontaneously heal and are actually related to the establishment and maintenance of immunity.

It is true that in the majority of our B. C. G.-inoculated guinea pigs which died from causes other than tuberculosis at an early stage of the experiment, the tuberculous lesions observed at postmortem examination, though limited and relatively slight, were nevertheless more prominent than those found in some other guinea pigs which died or were killed at later stages in the experiment. Furthermore, at still later stages or at the end of the experiment, many of the animals were entirely free from tuberculous lesions. These observations, up to a certain point, support the view of the benign character of the infection and of the tendency to spontaneous healing. Nevertheless, in a small minority of the animals, instead of healing and disappearing, or instead of a benign infection, the lesions slowly extended, multiplied and terminated in generalized caseating tuberculosis, and were then *transferable without difficulty from guinea pig to guinea pig*. Furthermore, inoculations made from the supposedly benign lesions failed in some instances, but were successful in others, in producing typical and fatal tuberculosis.

How can one explain occasional virulence of B. C. G. for guinea pigs as we have seen it in our experiments? In conducting numerous pathogenicity tests with many different strains of tubercle bacilli, we have frequently remarked that the more virulent the strain the more uniform and constant were the effects of it; and, on the other hand, the less the virulence of the infection the more variable and uncertain were the reactions to it. Although the guinea pig has a great susceptibility, it varies considerably in different individuals. In sensitizing guinea pigs with tubercle bacilli for tuberculin potency tests and standardization purposes, uniformity is particularly desirable and tried for, but it is a common experience, even when the inoculations are made with the same strain of tubercle bacilli, by the same route and in exactly the same dosage, to meet with a marked variability in the time and degree of sensitization and in the subsequent duration of infection.

Our guinea pigs subsist during the spring and summer months almost entirely upon fresh grass cuttings and green food, in the autumn and early part of the winter upon mangels and sugar-beet roots, and from January to, April mainly upon dry hay and grain. It is during the latter period that their vitality and resistance to disease appears to be lowered and they are more subject to pneumonia and other diseases. Possibly the same factors, seasonal and nutritional, play a part in lowering resistance to tuberculosis, though conceivably less in evidence and less important when the infecting tubercle bacilli are of high than when of low virulence.

All that we can say at this stage is that B. C. G. infection in guinea pigs is not always of a benign character, but may, in the course of time, develop into harmful activity and even lead to typical tuberculosis and death.

Experimental B. C. G. infection in the guinea pig may be of very long duration. It is not safe to say that the localized lesions which may be present at the third, sixth or ninth month, or even after one year, are of a wholly benign character, even though this may appear to be true in the majority of cases. In those of our guinea pigs which finally developed typical tuberculosis, the time required averaged ten to eleven months (in some cases more than one year). In one experiment (No. 9) it may be noted that in eleven out of twenty inoculated animals, after an average duration of nine months, no lesions were discernible;

and in the other nine, in which tuberculous lesions were found, the average duration was twelve and one-half months.

Summing up the duration period in all our pathogenicity tests, we find the following:

No lesions discernible in 94 guinea pigs (average duration—192 days).

Early, slight or localized in 32 guinea pigs (average duration—290 days).

Typical tuberculosis in 9 guinea pigs (average duration—309 days).

Does this not signify that *time* is an important factor in determining the virulence of B. C. G.?

The published reports of those conducting B. C. G. pathogenicity tests upon guinea pigs indicate, for the most part, that the observations were made upon animals killed two, three, four or five months after inoculation. Therein, possibly, lies an explanation, in part at least, of their negative findings or of finding only benign (?) lesions.

The work of S. A. Petroff, on "microbic dissociation" of tubercle bacilli, has a particular interest, as he claims to have separated B. C. G. cultures into two types of colonies which he designates as "R" and "S," one of which is non-virulent and the other virulent for the guinea pig.

The question of virulence is one of paramount importance and agitates the minds of those engaged in or contemplating the practice of B. C. G. vaccination.

We anticipate severe criticisms of our experiments and that there will be offered various explanations, other than that of virulence, of the results herein reported.

We can definitely eliminate any question of spontaneous or naturally acquired tuberculosis. For years we have followed the practice of submitting to postmortem examination every guinea pig which dies from natural causes or by accident in the small-animal breeding-houses, and we have not been able to discover a case of natural or spontaneous infection.

Furthermore, we have had occasion to record the interesting fact that normal, healthy guinea pigs, when placed as control animals in the same cage with tuberculous guinea pigs, and surviving the latter, appear to escape infection, as no lesions could be found in them when killed.

But to make doubly sure, and to eliminate any question of spontaneous infection, the B. C. G.-inoculated guinea pigs (experiments 5 to 15 inclusive) were confined in a building separate from all others, and where no other guinea pigs were housed.

As to possible contaminations of our cultures, we can only say that from the moment we received the B. C. G. samples from the Pasteur Institute, we realized the necessity of taking the utmost care and precautions to guard them and every series of subcultures against contamination, and we have, from the start, exercised all possible vigilance and safeguards. We are absolutely satisfied that it is neither a question of ulterior contamination of our guinea pigs nor of our cultures.

We submit that these experiments and the results therefrom are convincing enough to pose the question as one of virulence only. Accordingly, we have come to the following conclusions:

First, that *Bacillus-Calmette-Guérin* has not been entirely deprived of virulence, nor is it innocuous for all species of animals, particularly the guinea pig.

Second, that virulence is a *latent* property of B. C. G., requiring some unusual stimulus and, especially, *time*, to awaken it to activity.

Third, that it is capable of causing in some guinea pigs, after a long period of infection and tolerance, a progressive and fatal tuberculosis, which then becomes re-inoculable and transferable from animal to animal in serial passage.

II. Experimental B. C. G. Vaccination Against Bovine Tuberculosis

An "Interim Report of Experiments on Calves in Relation to Susceptibility, Infection and Immunity," September, 1927,* included some experiments with B. C. G. vaccination of calves—groups VII A, VII B and X. Only those calves that had died or were killed were reported upon. All the calves, numbering twelve in the original group (VII B), and five out of ten calves since added to it (group VII C), have been killed. The conditions under which the experiments were made upon these seventeen calves are as follows:

The calves were born of tuberculin-tested, non-reacting cows in accredited herds and very soon after birth were removed to and segregated at the Government Experimental Farm, Ottawa, where they were fed on milk from tuberculin-tested, non-reacting cows until after vaccination with B. C. G. At the time of vaccination the calves were from four to seven days old and, with a reasonable certainty, were then free from tuberculous infection. Within the week following vaccination the calves were removed to a

*JOUR. A. V. M. A., lxxi (1927), n. s. 24 (6), pp. 732-741.

TABLE I—Pathogenicity tests on guinea pigs

GUINEA PIGS INOCULATED WITH B. C. G. VACCINES (CULTURE TO GUINEA PIG)										POSTMORTEM EXAMINATIONS TUBERCULOSIS LESIONS (SPLEEN, LIVER, LUNGS AND LYMPH-GLANDS)										SERIAL ANIMAL PASSAGE WITH B. C. G. LESIONS (GUINEA PIG TO GUINEA PIG)							
EXPERIMENT	DATE OF INOCU- LATION	B.C.G. VACCINE	GUINEA PIGS (TOTAL NUMBER)	DEAD FROM CAUSES OTHER THAN TUBERCU- LOSIS		DEAD FROM TUBERCU- LOSIS		KILLED		NO LESIONS DISCERN- IBLE		EARLY, SLIGHT OR LOCALIZED		EXTENS- IVE, AD- VANCED OR GEN- ERALIZED		1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH				
				No.	DAYS	No.	DAYS	No.	DAYS	No.	DAYS	No.	DAYS	No.	DAYS												
1	1-20-25	(80) A	16	7	148	6	310	3	294	6	172	1	6	9	305	+	+	+	+	+	+	+	+				
2	3-11-25	" B	2	2	30					1	32	1	29														
3	5-13-25	" C	4	4	38					4	38																
4	7-15-25	" D	2	2	64					2	64																
5	12-24-25	" E	28	4	208			24	383	24	346	4	312														
6	6-28-26	" G	2	2	94					2	94																
7	8-27-26	" H	10	3	182			7	367	4	339	6	296			+	+	+	+				+				
8	8-27-26	" I	10	4	279			6	371	4	367	6	312			+	+	+	+								
9	8-27-26	" J	20	8	142			12	433	11	276	9	371			+	+	+	+								
10	12-16-26	" M	2					2	243	2	243					+	+	+	+								
11	10-14-26	(17) K	20	1	71			19	376	19	376	1	71			+	+	+	+								
12	11-5-26	" L	5	4	221			5	331	5	331																
13	4-13-27	" N	4	2	293			1	351	3	286	1	23														
14	4-19-27	" O	3	2	293			3	312	3	312																
15	5-9-27	" P	6	2	159	1	335	3	338	2	184	1	342	3	319	+	*										
Guinea pigs Total numbers			134	45		7		82		92		30		12													
Average duration in days				157		314		365			192		290		309												
Percentage				33.5	5.4	63			68.7	22.3				9													

+= Death from tuberculosis. * = Being continued.

* = Being continued.

- = Free from tuberculosis.

+ = Death from tuberculosis.

TABLE II—*Experimental B.C.G.*

New-born calves, of tuberculin-tested, non-reacting cows (accredited herds), vaccinated with B.C.G. and subsequently exposed to natural infection (through the milk and by co-habitation with tuberculous cattle)

	B.C.G. VACCINATION					DURATION OF TRIAL, AGE WHEN KILLED	
	CALF No.	SEX	DAYS OLD	DATE	DOSE (MGS.)	YEARS	MONTHS
Group VII B	87	F	7	1-9-26	75	1	3
	88	M	7	1-9-26	75	1	3
	89	M	7	1-9-26	75	1	3
	90	M	7	1-9-26	75	1	3
	92	M	7	1-9-26	75	1	3
	91	F	7	(Non-vaccinated)		1	3
	94	M	7	1-9-26 5-9-27	75 100	1	10
	97	M	7	1-9-26	75	1	11
	95	F	7	1-9-26 5-9-27	75 100	2	1
	93	F	7	1-9-26 5-9-27	75 100	2	1
	96	F	7	1-9-26	75	2	1
	106	M	30	(Non-vaccinated)		1	8
Group VII C	108	M	4	10-30-26	100	1	9
	111	M	4	10-30-26	100	1	9
	110	M	5	10-30-26 12- 9-27	100 75	1	9
	117	M	4	10-30-26 12- 9-27	100 75	1	9
	116	F	1	(Non-vaccinated)		1	9

- = Caseons.
 ■ = Caseo-calcareous.
 ◆ = Calcareous.

vaccination against bovine tuberculosis

POSTMORTEM EXAMINATION (TUBERCULOUS LESIONS)								ACID-FAST BACILLI PRESENT		GUINEA PIG INOCULATION (TESTS OF TUBERCULOUS LESIONS)	CALF No.
SUBMAXILLARY	RETROPHARYNGEAL	PERIBRONCHIAL	MEDIASTINAL	MESENTERIC	PORTAL	PREPECTORAL	PLEURA	LUNGS	VACCINAL FOCUS	TUBERCULOUS LESIONS	
	●			●						+	87
			●	●						—	88
		■							—	+	89
		■	■							+	90
		■	■					●		—	92
		■								+	91
		◆	◆						+	—	94
		■	◆					●	—	+	97
		●	●	●				●	+	+	95
		■	■	●				◆	—	+	93
	●	◆	◆							—	96
●	●	■	■	●				●			106
		●	●	●				●	+		108
	●	●	●	●	●	●		●		+	111
		●	●				●	●	+	+	110
		●	●					●	+	+	117
		●	●					●		+	116

(Under observation)

segregated herd of tuberculin-reacting cows—a so-called “Bang” herd—and were fed until five to six months of age with the milk from these reacting cattle. They were then removed to the Research Station and were pastured and stabled with tuberculin-reacting cattle, remaining there until killed.

The calves were well fed and developed normally, maintaining a well-nourished condition throughout the entire period of observation and trial which varied from fifteen to twenty-five months. Five of the calves were re-vaccinated during the second year. Three calves remained unvaccinated as controls. The calves were killed at the Research Station where the autopsies, microscopical examinations and guinea-pig test-inoculations were carried out under laboratory conditions.

The experiments and results are shown in tables I and II.

Group VII B (calves 87-96):

Ten calves, seven days old, received a vaccinating dose of 75 mgs. (moist weight) of B. C. G. (80).

Five of these and one non-vaccinated control calf were killed after a delay of fifteen months. In all six calves definite lesions of more or less slight extent but typical of the early stages of tuberculosis were uncovered at postmortem examination. In two of these (89 and 91), one vaccinated, the other non-vaccinated, the discernible lesions, consisting of caseating focal areas, 2.5 by 1.2 cm. in extent, were limited to the bronchial lymphatic ganglia and the two cases were nearly identical. The lesions from each calf, inoculated into guinea pigs, caused generalized tuberculosis. In the four other calves two groups of lymphatic ganglia were visibly tuberculous and, in one of the four, the lungs, in addition, showed typical areas of tuberculosis. The lesions for the most part consisted of small tubercles, up to the size of a pea, some purulent, some caseous, others caseo-calcareous, but in calf 92 the entire glands and two small areas in the lungs were typically tuberculous.

Three of the remaining calves were re-vaccinated with 100 mgs. of B. C. G. (17) and these, with the two calves once vaccinated and the control non-vaccinated calf, were killed after a further delay of five to ten months, or twenty to twenty-five months after the commencement of the trial. In the six calves both bronchial and mediastinal lymphatic ganglia were tuberculous and in four of these pulmonary lesions were also discernible. In two of these calves, three groups of lymphatic

ganglia, as well as the lungs, were tuberculous. Vaccinated calf 95 gave lesions typical of active and progressive tuberculosis, no less but rather more extensive than in the non-vaccinated control, calf 106. Lesions from the ten vaccinated and the two non-vaccinated animals, in guinea-pig test-inoculations, were positive and productive of generalized tuberculosis.

Group VII C (calves 107-117):

Eight calves, four to five days old, received a vaccinating dose of 100 mgs. (moist weight) of B. C. G. (17).

Four of these, two of which had been re-vaccinated thirteen months later, and one non-vaccinated control calf, were killed after twenty-one months of trial (the remainder being held over for further delay). In each of these animals tuberculous lesions were uncovered, comparable to but more extensive and more active than those found in the preceding groups. Calf 111 had developed a generalized tuberculosis, involving the entire peribronchial and mediastinal lymphatic ganglia and the lungs. Extensive lesions were found also in the retropharyngeal, prepectoral, portal and mesenteric chains of lymph-glands.

These two groups of vaccinated calves were exposed to the same sources of natural infection, that is to say, they were associated with the same tuberculin-reacting cows, though cohabitation in group VII C was at a period ten months later than in group VII B.

On the whole, the lesions uncovered in the five animals in group VII C, after a delay of twenty-one months, were more numerous, extensive and progressive than those seen in the second half of group VII B, 20-25 months, which in turn were clearly more pronounced, more numerous and showed more caseation than those of the first half of group VII B, killed at the fifteenth month of trial.

Altogether the picture is one of slowly progressive tuberculosis and typical of the disease as naturally contracted and developing in young cattle of the age of these experiment animals. There are only three non-vaccinated as against fourteen vaccinated cattle, but as far as a comparison is possible with these unequal numbers, there is nothing in favor of the vaccinated nor any evidence to indicate a greater degree of resistance on their part to tuberculosis.

Furthermore, it is well to note that even though resistance may be increased as a result of B. C. G. vaccination, the vac-

inated animal living in a tuberculous environment becomes a carrier of pathogenic tubercle bacilli no less virulent, as shown by the guinea-pig tests, than those carried by the non-vaccinated animal.

DISCUSSION

As already intimated, these experiments were undertaken in consequence of the published announcements of Professors Calmette and Guérin, in 1924, of their "New Method of Prophylaxis in Bovine Tuberculosis," which required only vaccination of the new-born calves by a subcutaneous inoculation of B. C. G. within fifteen days of birth and "before exposing them to massive infection or to discrete but repeated infections with virulent tubercle bacilli."

Particularly, we have followed with great interest and kept in mind the story of the tuberculous farm at Gruville, near Fecamp (Seine-Inferieure), 1921-1927, as related by Professors Calmette and Guérin, in the *Annales de l'Institut Pasteur*.^{*} The problem upon this farm, which for many years had suffered heavy losses from tuberculosis, in the translated words of the authors, was: "*Upon premises infected with tuberculosis, without changing in any way the mode of existence or the habitat of the animals, without modifying the customary methods of raising the calves, is it possible, through the ordinary course of births, by vaccinating the new-born within the first fifteen days of their life, and in re-vaccinating them each year, to eliminate tuberculosis from this farm in the space of five years?*"

Accordingly, the French veterinarians *suspended all prophylactic measures of isolation and disinfection*, and substituted B. C. G. vaccination.

The results, in the opinion of Calmette and Guérin and as reported in 1927, showed that B. C. G. vaccination had proved successful and had practically solved the problem of tuberculosis.

Particularly interesting is the mention of twenty calves born of tuberculous mothers or suspects which had been fed during their first months with the raw unbeated milk of the mothers, and which, along with ten others, or thirty in all, vaccinated and revaccinated, arrived at the abattoir free from any tuberculous lesion.

We have endeavored to repeat some of these experiments upon young cattle with the object of proving the "*simplicity, innocuity*

^{*}Vol. xxxviii (1924), p. 393; vol. xli (1927), p. 17.

and efficacy" of B. C. G. vaccination as applied to the farm at Gruville.

The conditions under which our experiments were carried out were not quite the same, it is true, as those at Gruville. We decided against conducting the trial upon a privately-owned herd, but to purchase the animals and keep them continuously under our own control and constant observation.

The conditions, as compared with those at Gruville, were in favor of our animals, as they were purchased from accredited, tuberculosis-free herds, and were the offspring of tuberculin-tested, non-reacting parents, thus fulfilling the essential condition laid down, namely, that the calves must be *vaccinated before exposure to infection*. Subsequently these calves, including non-vaccinated controls, which, it may be remarked, were lacking at Gruville, were fed the milk of tuberculous or suspected cows as was done at Gruville, with the unhappy result that all of the seventeen animals in the experiment were found with tuberculous lesions when killed at the laboratory abattoir.

We must now state, however, that, in 1927, Professors Calmette and Guérin introduced an important modification of the conditions under which B. C. G. vaccination should be practiced, namely, the isolation of calves, feeding them only boiled milk and guarding them against possible contamination for thirty days after vaccination—a reasonable condition for the establishment of immunity prior to virulent infection, but one which destroys much of the "simplicity" of B. C. G. vaccination and must in many instances be difficult to apply. We assume that results have been reported, though not published, similar to ours, making this important modification advisable and necessary.

We now have a new series of calves under experimental B. C. G. vaccination and under the new condition of isolation, and so forth, for thirty days.

At the present time, in view of the results of our experiments and in spite of the extensive trials or practice of B. C. G. vaccination in Europe and in the French colonies, we feel that we are fully warranted in considering B. C. G. vaccination as in the experimental stage, and, in respect to its innocuity and efficiency, open to question.

ACKNOWLEDGMENTS AND THANKS

First, to Professors Calmette and Guérin for their kindness in sending me cultures of their bacillus B. C. G., also for the per-

sonal interviews accorded me and for the privilege of visiting the farm at Gruville under their own guidance. To Hon. W. R. Motherwell, Minister of Agriculture, and to Dr. Geo. Hilton, Veterinary Director General, for authorizing these researches and the financial provisions for carrying them out. To Dr. E. S. Archibald, Director of Experimental Farms, and to Mr. Geo. B. Rothwell, Dominion Animal Husbandman, for facilities afforded and for placing animals at our disposal.

U. S. CIVIL SERVICE EXAMINATION

The United States Civil Service Commission announces an open competitive examination for junior veterinarian to fill vacancies in the Bureau of Animal Industry, Department of Agriculture, for duty in the field. The entrance salary is \$2,000 a year. Positions carrying higher salaries are filled through promotion.

Applicants must have been graduated from a recognized veterinary college and those participating in the examination will be rated on veterinary anatomy and physiology, veterinary pathology and meat inspection, and theory and practice of veterinary medicine.

Full information may be obtained from the United States Civil Service Commission, Washington, D. C., or from the secretary of the United States Civil Service Board of Examiners at the post office or customhouse in any city.

Applications for this examination must be on file with the Civil Service Commission at Washington, D. C., not later than November 20.

For this position the Department of Agriculture wishes men.

VETERINARY HOSPITAL FOR ARGENTINA

On May 11, 1928, the School of Agriculture and Veterinary Medicine of the University of Buenos Aires, Argentina, opened three new buildings for its hospital on the grounds of the school. One of these buildings is the surgical ward, the second is for purebred horses and the third is for ordinary horses. Sheep, hogs, dogs and cats will also be treated. When the hospital is complete, there will be fifteen buildings, distributed over an area of nearly ten acres.

—*Bulletin of the Pan-American Union.*

THE FEDERAL FOOD AND DRUGS ACT AND THE INSECTICIDE ACT: THEIR IMPORTANCE TO THE VETERINARY PROFESSION, AND PERSONAL EXPERIENCES IN THEIR ENFORCEMENT*

By B. T. WOODWARD

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From the professional viewpoint, the success of the veterinary practitioner of today and that of his predecessors extending even back beyond the organization of the first veterinary college, depends upon his knowledge and skill as a surgeon, his skill as a diagnostician, his knowledge of the therapeutic action of drugs and the reliability of drugs in producing the expected results in such a manner that there was created in the owner of the animal a feeling of faith in the veterinarian and in drugs themselves. The practitioners of human medicine, in the large numbers in which they are distributed, have not been able to supply all of the needs and demands of the public for the drugs to assist nature in combating various diseases and conditions.

In the veterinary profession, this condition has been true to a greater extent, and today with the decreased enrollment in our veterinary colleges, there exists an actual need for the distribution of drugs and the dissemination of the knowledge of their actions to the increasing number of owners of live and pet stock, who are unable, through no fault of their own, to secure the professional services of a qualified veterinarian. Without considering the welfare of the members of the veterinary profession, the Congress of the United States looked to the welfare of the animal population and to the protection of its owners.

In 1906, there was passed the Federal Food and Drugs Act, and in 1910, the Federal Insecticide Act. Basically, the purposes of both of these Acts are to protect the public from the false and fraudulent claims of the therapeutic efficiency of drugs and the value of insecticides and disinfectants, and to enable the public, with its constantly increasing enlightenment, to select proprietary preparations of drugs and chemicals with the assurance that

*Presented at the sixty-fifth annual meeting of the American Veterinary Medical Association, Minneapolis, Minn., August 7-10, 1928, following presentation of report of Committee on Proprietary Pharmaceuticals. (See JOURNAL, October, 1928, p. 757.)

the claims made upon the labels would be substantiated in the experience of the user.

It is with regret that I must acknowledge that, following the passage of the Food and Drugs Act, there elapsed a period of probably twenty years during which the veterinarians individually and in their organizations failed to appreciate the wonderful value of the congressional acts in stimulating faith in the value of drugs and in the veterinary profession, and failed to participate ethically in the enforcement of these Acts. The U. S. Bureau of Chemistry was charged by Congress with the enforcement of the Food and Drugs Act, and this unit of the government found that it did not have any veterinarian upon its rolls.

In 1908, the Bureau of Animal Industry detailed me as a consulting and cooperating veterinarian to the Bureau of Chemistry. The requests of this Bureau for assistance were at that time few and irregular. If the veterinary practitioners of the country had realized the importance of the enforcement of this Act to their personal welfare and to the progress of their profession, their influence would have changed this condition until the Bureau of Chemistry recognized the veterinary proprietary preparation as the most important feature in the enforcement of the law as it related to misrepresentations of therapeutic claims.

SERIOUSNESS OF SITUATION REALIZED

Time passed onward and cases against the manufacturers of these preparations were dropped on account of age limitations and the fact that there was no organized interest urging them to early judgment. Gradually a realization of the seriousness of the situation was brought home to the Bureau of Chemistry, not by the veterinarian but by the stock-owner, who suffered extensive losses by treating his live-stock with fake remedies, and through the interest of the Bureau of Animal Industry, particularly in reference to preparations which were offered for the prevention, treatment or cure of the communicable diseases of live stock against which the Bureau was waging an active war.

The increased activity of the Bureau of Chemistry met with an immediate response from the unscrupulous or ignorant manufacturer or distributor, and political pressure was brought to bear in every possible way upon the government officials. At this point, I wish to state clearly that such pressure has in no case, to my knowledge, resulted in a lack of the enforcement of the law or overlooking its requirements, although, on account of

this influence, enforcing officials at times met with many difficulties, delaying the final action upon cases.

When a manufacturer was notified that his veterinary preparations were being sold in interstate commerce in violation of the law, it became common practice for him to come to Washington armed with letters which he considered to be of political weight and accompanied by an attorney. Through many long hours of conferences, it has usually been my experience to find that the attorney employed in such cases is interested solely in determining the limit to which his client may go in making claims for the effects of his preparation without technically violating the law and thus making him liable to action under its provisions. The lawyer was not interested in this spirit of honesty upon the labels, of fairness to the purchaser, or of the welfare of the live stock industry.

To the discredit of individuals in our profession, it must be told to our Association, that qualified veterinarians employed by manufacturers appeared in their behalf and showed the same attitude as that exhibited by the attorneys, and in some cases the veterinarian was also the manufacturer making the false and fraudulent claims.

It is refreshing to tell you that in recent years there has been a constantly increasing number of manufacturers or distributors who have voluntarily appeared before the officials in Washington for the purpose of obtaining the knowledge which would enable them to make the claims on all of the labels to agree with both the spirit and the letter of the law. For illustration of the conditions experienced in enforcement, I will present a few examples:

BOWMAN ABORTION REMEDY

First, because it is familiar to many of you by name, let me cite the case of the Bowman Abortion Remedy. The chemical analyses of this remedy, as made by both federal and state laboratories, indicate that it consisted of brown sugar in approximately 85 per cent and ground bran or waste meal products to make up the remainder. A company was organized in Minnesota to manufacture, advertise and sell this product, which at one time claimed to be 100 per cent efficient in preventing abortion in cattle and was guaranteed to overcome sterility in both the cow and the bull, to assure the birth of calves without a dystokia, and that the calves would not be susceptible to pneumonia or dysentery.

A nine-pound package was sold for \$5.00. Three pounds were given to an animal on alternate days until three doses had been given. All the results claimed for it were to be attained without regard to the pregnancy or non-pregnancy of the animal treated, and the protective value of this preparation against contagious abortion was to remain effective for at least one year. This preparation and its extremely extensive advertising probably did more to arouse the veterinary profession to the dangers of the lack of enforcement of the Food and Drugs Act than any other case which has reached the federal courts.

Having a knowledge of the existence of this so-called remedy before its distribution was undertaken, I was enabled to secure some of the earliest advertisements and had the privilege of originating the investigation against it. As soon as this investigation was undertaken, strenuous efforts were brought to bear to nullify it and certain members of the United States Senate and House of Representatives appeared in its behalf. Despite the fact that every veterinarian knew the falsity and fraudulency of the claims for this preparation, it became necessary for the government to conduct scientific tests of it in the field and laboratory. This work and other influences greatly delayed the progress and final action upon the case.

OTHER ABORTION REMEDIES APPEAR

As this case was developed, it was a surprise to disclose the action of several licensed veterinarians who were semi-secretly selling this fake preparation on commission to clients who employed them for the honest treatment of their live stock. During this period, a new lot of preparations offered for contagious abortion was constantly making its appearance, and the delays in the procedure of the Bowman case effectually, though temporarily, tied the hands of enforcing officials against these new preparations and others upon which action had been started.

Eventually, shipments of Bowman's Abortion Remedy were seized by United States marshals and the case was brought in the Federal Court at Cleveland, Ohio. In preparing this case, I visited veterinary practitioners and the veterinary educational institutions in the United States, and when I returned to the Washington headquarters, I felt unusually proud of my profession in reporting the universal response which I had had for veterinarians of the highest calibre to appear as expert witnesses for the government, solely in the interest and the welfare of their

profession and of the live stock industry. The case was decided in favor of the government, and a sweeping and valuable decision was handed down by the judge.

Following the close of this case, action was promptly instituted against the remainder of approximately thirty manufacturers of so-called abortion remedies and, at the present time, I feel safe in stating that at least a very large majority of these preparations have been absolutely removed from the market, or their labeling so changed as to remove any reference to abortion or its allied conditions.

The veterinary activities of the Bureau of Chemistry were showing a continuous and active growth when a reorganization within the Department of Agriculture was authorized by Congress. In this reorganization, it was directed that I assume charge of the enforcement of the laws relating to veterinary preparations coming within the scope of both the Food and Drugs Act and the Insecticide Act. This specializing centralization permitted the establishment of a definite campaign looking toward the removal from interstate commerce of all proprietary preparations alleged to be a preventive, treatment or cure for the communicable diseases of live stock and poultry. This campaign was made active against preparations relating to each class of farm animals and pet stock, as well as chickens and turkeys.

VIOLENT REACTION OCCURS

Again in the history of the enforcement efforts, a violent reaction occurred. There were threats of legal proceedings to hamper the government by the combining of manufacturers for the purpose of employing high-priced legal talent to combat the laws, and even congressmen appeared and fought in behalf of their constituents, although it was demonstrated to them that the sale of such medicines by their constituents was not only defrauding the public, but was an actual menace to the great live stock industry.

Stop for a moment and consider the effects which were being instilled in the minds of the owners of animals. Medicines were being purchased with labels promising definite results. These results did not follow, and the purchaser usually did not blame the manufacturer who sold the medicines with false claims of efficiency, but considered that drugs themselves were failures. As drugs are used by the veterinary practitioner, the loss of faith

in the action of drugs was reflected in the lessened use of the services of the veterinarian.

The creditable activity of the veterinary profession and the cooperation of organized live stock owners year after year resulted in the appropriating of constantly increasing sums of money by the federal and state governments to combat and eradicate the great animal plagues. To expend these moneys, live stock sanitary legislation was passed.

It is well recognized that there is always an element of the public which combats any effort toward regulation or control. The unscrupulous manufacturer of proprietary medicines recognizes this element and capitalizes upon it. It is these people who purchase the fake remedies, who attempt to hide the presence of communicable diseases in their live stock, and who, by this combination, serve to create and maintain what are, for at least a time, hidden centers from which disease is disseminated, causing severe losses to their neighbors and endangering the live stock industry.

VETERINARIANS SLOW TO PARTICIPATE

In his constant fight for recognition and utilization as a highly specialized professional man, the veterinarian was still failing to recognize or absolutely refusing to engage actively in the battle which was being waged by federal and state governments to make it impossible for the live stock owner to be imposed upon by the sale of false and fraudulent remedies.

During the 1927 meeting of the American Veterinary Medical Association, an epochal step was taken by the formation of the Committee on Proprietary Pharmaceuticals. This Committee will endeavor to arouse every member of the Association and of the profession to the importance of his duty in directing attention to every proprietary preparation sold within his territory which makes false and fraudulent therapeutic claims.

This Committee has before it one of the most important lines of activity which has ever been entered upon by its parent association. The scope and value of its work will be limited only by the time which its members are enabled to give to it and the needed financial backing which it receives from the Association. The Committee should unreservedly cooperate with the U. S. Food, Drug and Insecticide Administration, and in this combination of activities, the largest and most rapid

results should be continually attained in protecting the live stock owner from false medicines.

Another valuable adjunct will be the establishment, through this Committee, of an advisory service to the publishers of magazines and newspapers, which will enable them to reject from their advertising columns the advertisements of preparations which do not meet the requirements of the Committee and are in violation of the federal laws.

FUNCTIONS OF THE COMMITTEE

The following four purposes of the Committee provide a definite basis upon which its activities are being formulated:

First: To investigate and report upon the accuracy of therapeutic claims and the fact or falsity of any and all statements appearing upon the labelling and in collateral advertising, both printed and verbal, of proprietary pharmaceuticals offered to the veterinary profession and to the public.

Second: To publish the reports of these investigations in the JOURNAL of the American Veterinary Medical Association, including a statement of the decision of the Committee in regard to the compliance or non-compliance of the preparation with its requirements.

Third: To publish in the JOURNAL of the American Veterinary Medical Association the Notices of Judgment obtained in the federal courts by the U. S. Food, Drug and Insecticide Administration against manufacturers or distributors of proprietary preparations, veterinary and otherwise, as may be judged to be for the best interests of the veterinary profession, the labelling of which was in violation of the federal laws.

Fourth: To pass upon the acceptability for publication in the JOURNAL of the American Veterinary Medical Association of any and all advertisements submitted to appear in that publication and relating in any manner to any proprietary preparation.

Let me urge every member of the Association to perform his duty in reporting to the Committee detailed facts relating to the sale of any preparations which he considers are harmful to the live stock owner and the veterinary profession and, if he desires, he should also file this information with the Federal Food, Drug and Insecticide Administration for its attention. Feel assured that the government will not overlook this information.

The manufacturer will be given an opportunity to correct his labelling, or, if necessary, to discontinue the sale of his prepara-

tion without legal action being instituted. If the manufacturer refuses to take advantage of these opportunities, the laws provide for the seizure, by order of the United States Courts, of the preparations which are moved in interstate commerce or the inauguration of criminal proceedings against the shipper.

The Association is to be congratulated upon the personnel which has been selected for this most important committee. For the accuracy and uniformity of its decisions, it is suggested that its members serve for a period of at least five years, and that successive appointments to this Committee be made annually for such a period of service.

Let us remember that proprietary remedies have always had a legitimate place in providing a home treatment for the minor diseases and ailments of animals, and with the present scarcity of graduate veterinarians in many farming districts of the United States, a still greater need for proprietary preparations which have a real and known value in the treatment of live stock and poultry has developed.

A REMARKABLE RECORD

During the session of the Missouri State Board of Veterinary Examiners, held at Sedalia, August 20-21-22, one of the applicants was Dr. J. I. Gibson, ex-state veterinarian of Iowa, and at present consulting veterinarian to the Hillyard Chemical Company, of St. Joseph, Mo.

It has been forty-two years since Dr. Gibson was graduated from the Ontario Veterinary College, and a man with such a long career in back of him is always supposed to be rusty. However, Dr. Gibson has succeeded in keeping the machinery very bright, probably with the use of midnight oil, as he passed one of the most technical and finest examinations written by any applicant coming before the Missouri Board for the past several years. This is indeed a remarkable record for a man of Dr. Gibson's age, as a lot of water has run under the bridge since the day of his graduation as a young man back in Canada, almost a half-century ago.

This incident should be a stimulus to the members of the younger generation to keep abreast of the times, and not permit themselves to fall into the rut which commonly receives the average man in any walk of life.

H. A. W.

A MEDIUM FOR THE ISOLATION OF SALMONELLA PULLORUM AND OTHER MEMBERS OF THE PARATYPHOID GROUP FROM AVIAN TISSUES

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The usual method of isolating organisms from avian tissues consists in smearing sections of the various organs over the surface of a solid medium. Usually the medium used is selected on the basis of its ability to grow the desired organism. No attempt is made to use so-called selective media, such as are used in feces examination and water analysis. Very frequently in the diagnostic laboratory dealing with poultry, specimens are received in such a state that the tissues have become invaded by saprophytes, rendering a bacteriological examination impossible. Quite frequently plate cultures made from freshly killed fowls are overgrown completely by spreaders and *Escherichia coli*. The use of a selective medium should help to eliminate such difficulties.

Many antiseptic substances have been recommended as inhibitory agents in nutrient media, and of these the only effective ones appear to be the aniline dyes. The antiseptic properties of the aniline dyes have been known for many years. As early as 1890, Cornil and Babes¹ observed the germicidal properties of crystal violet. In 1902, Conradi and Drigalski² recommended the use of crystal violet in nutrient media used for the isolation of *Escherichia coli* and *Eberthella typhi*. Since then a multitude of papers has appeared on the use of dyes as selective agents in nutrient media.

In 1913, Torrey³ recommended the use of brilliant-green broth as an enrichment medium for the isolation of paratyphoid organisms. He found that *Salmonella schottmulleri* and *Salmonella enteritidis* were unaffected by this dye, while Gram-positive organisms and *Escherichia coli*, *Eberthella dysenteriae* and *Alkaligenes fecalis* were inhibited. So great was the specific action of this dye that even when *Salmonella schottmulleri* was mixed with *Escherichia coli* in the ratio of 1 to 180,000, the *Salmonella*

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schotmulleri would develop on smeared plates while the *Escherichia coli* would be completely suppressed.

In 1922, Winslow and Dolloff⁴ reported that the presence of bile salts reduced the activity of brilliant green in enrichment media. They reported that the presence of the bile salts reduced the bacteriostatic effect of brilliant green from 1 to 1,000,000 in plain lactose broth to 1 to 1,000 in lactose-bile broth. No explanation of this action is presented.

In 1927, Rakieten and Rettger⁵ confirmed the work of Torrey with the paratyphoid organisms. They found that the activity of the brilliant green is influenced by the reaction of the medium. An acid medium favored the activity of the dye, while an alkaline medium suppressed its activity materially.

Our problem was to find a selective inhibitory agent that would suppress the development of all Gram-positive organisms and such Gram-negative organisms as *Escherichia coli* and allow the unrestricted development of members of the paratyphoid group, particularly *Salmonella pullorum*, *Salmonella gallinarum* and *Salmonella anatum*.

Accordingly, the following organisms were selected for the study: *Salmonella pullorum*, *Salmonella gallinarum*, *Salmonella anatum*, *Eberthella typhi*, *Escherichia coli*, *Staphylococcus aureus* and *Bacillus mycoides*.

Brilliant green was the only dye that had selective properties of the nature desired, as far as the literature reveals. However, the writers selected five dyes for a confirmatory study, inasmuch as these members of the paratyphoid group have not been studied in this manner. The five dyes selected were brilliant green, crystal violet, gentian violet, basic fuchsin, and acriflavine. These dyes were made up to one per cent aqueous solution, diluted to 1 to 1,000, filtered and stored in the ice-chest until used.

The medium used was standard meat-extract broth (A. P. H. A. Standard Methods for Water Analysis) to which appropriate dilutions of the dyes were added.

All tubes were inoculated with a loopful of a 24-hour broth culture of the desired organism. Tubes were incubated at 37° C. and readings were made at the end of 24- and 48-hour intervals. All tubes failing to show growth and those in which opacity produced by the dye rendered observation uncertain, were cultured into plain nutrient broth to determine the presence of viable organisms. In the case of the negative tubes, this pro-

cedure demonstrates whether the lack of growth was due to inhibitory action of the dye or to germicidal properties.

RESULTS OF TESTS OF DIFFERENT DYES

Basic fuchsin: A dilution of 1 to 1,000 inhibited the growth of *Escherichia coli*, *Salmonella gallinarium*, *Salmonella pullorum*, *Eberthella typhi* and *Salmonella anatum*, while the next higher dilution (1 to 10,000) gave unrestricted growth of all of them. Dilutions up to 1 to 150,000 inhibited the development of *Staphylococcus aureus* and *Bacillus mycoides*. No selective properties were evident other than the suppression of Gram-positive organisms.

Acridlavine: A dilution of 1 to 10,000 inhibited the growth of *Escherichia coli*, *Salmonella pullorum* and *Salmonella anatum*, while dilutions of 1 to 30,000 inhibited *Eberthella typhi*. *Salmonella gallinarium* grew in all dilutions tested (1 to 10,000 and greater). *Staphylococcus aureus* and *Bacillus mycoides* were inhibited by dilutions of 1 to 50,000 but not 1 to 100,000. Acridlavine appears to favor the development of *Escherichia coli* and the paratyphoid organisms, particularly *Salmonella gallinarium*, but has no practical significance.

Gentian violet: *Salmonella gallinarium*, *Salmonella pullorum* and *Salmonella anatum* grew in all dilutions (1 to 5,000 and greater) tested, while *Escherichia coli* and *Eberthella typhi* were inhibited in dilutions of 1 to 20,000 and 1 to 30,000 respectively. *Bacillus mycoides* and *Staphylococcus aureus* were inhibited in all dilutions tested (up to 1 to 100,000). This dye inhibited the development of *Escherichia coli* as well as the Gram-negative organisms, but again the differences in dilutions were not enough to warrant its use.

Crystal violet: The results with this dye, as might be expected from its chemical formula, were identical with those obtained with gentian violet.

Brilliant green: *Salmonella gallinarium*, *Salmonella pullorum* and *Salmonella anatum* grew in all dilutions tested (1 to 10,000 and above). *Eberthella typhi* was inhibited by dilutions of 1 to 50,000, but grew abundantly in 1 to 100,000. *Escherichia coli* gave only slight growth in 1 to 300,000, while *Bacillus mycoides* and *Staphylococcus aureus* grew slightly in 1 to 750,000. This dye allowed the development of the avian paratyphoid bacteria but inhibited *Escherichia coli* and Gram-positive organisms. The results are comparable to those obtained by Torrey and later

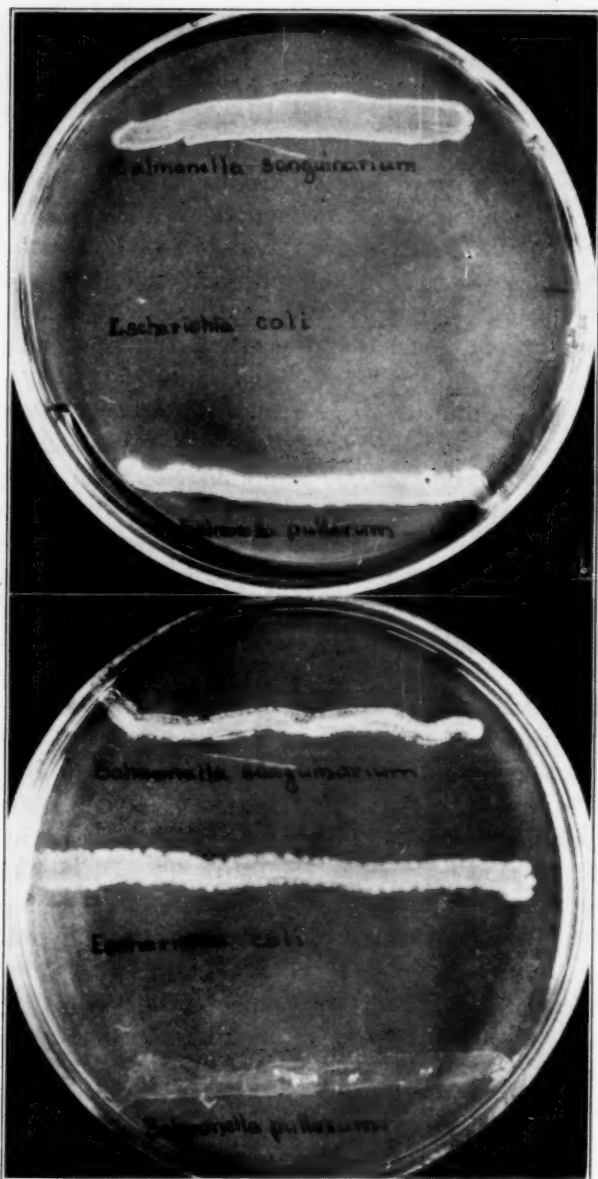


FIG. 1 (above). Effect of brilliant-green (1 to 100,000) liver-agar on *Salmonella Sanguinarum*, *Escherichia coli* and *Salmonella pullorum*.

FIG. 2 (below). Growth of *Salmonella sanguinarum*, *Escherichia coli* and *Salmonella pullorum* on plain liver-agar as compared with brilliant-green liver-agar (fig. 1).

by Rakieten and Rettger with *Salmonella paratyphi*, *Salmonella schotmulleri* and *Escherichia coli*.

Since the five dyes studied behaved as would be indicated by results of previous investigators, no other dyes were tested. Since brilliant green possessed all the properties desired, this dye was selected for further studies.

The effect of brilliant green was next tested in a solid medium. A liver-infusion-agar base was used. This medium gives an abundant growth of all the avian paratyphoids and is used in this laboratory for all routine work involving these organisms. The medium was prepared according to the methods recommended by Huddleson⁶ except that equal amounts of liver and beef infusion were used. The reaction was adjusted to pH 7.

The dye was added to the medium in varying amounts and thick plates were poured. These plates were smeared across the surface with loopfuls of the various organisms. The plates were incubated for 24 hours at 37° C.

The strongest concentration (1 to 50,000) produced no inhibitory effect upon *Salmonella gallinarium* and *Salmonella pullorum*, while *Eberthella typhi* and *Salmonella anatum* grew scantily. On 1-to-75,000 all of the above organisms grew abundantly. *Escherichia coli* was inhibited up to a dilution of 1 to 150,000. Figures 1 to 4 show the appearance of the streak cultures on 1-to-100,000 brilliant-green liver-agar compared with the controls on plain liver-agar. *Staphylococcus aureus* and *Bacillus mycoides* were inhibited in the highest dilution (1-200,000) used.

The tests were repeated on a new batch of liver-infusion-agar medium. The results were similar except that *Escherichia coli* grew in a dilution of 1 to 150,000 but not in a dilution of 1 to 125,000. The bacteriostatic effect of the brilliant green varies slightly in different batches of the same medium.

This solid medium gave the desired results when combined with the proper concentration of the brilliant green. The next step was to check the medium under routine conditions.

ROUTINE APPLICATION OF BRILLIANT GREEN AGAR

A flock of 53 cull birds was autopsied and cultured. Shortly after being killed, each bird was carefully autopsied and all organs destined for bacteriological examination were immediately cultured or stored in the ice-chest to prevent decomposition. All organs were cultured on plain liver-agar and brilliant-green (1 to 75,000) liver-agar. The plates were examined at the end

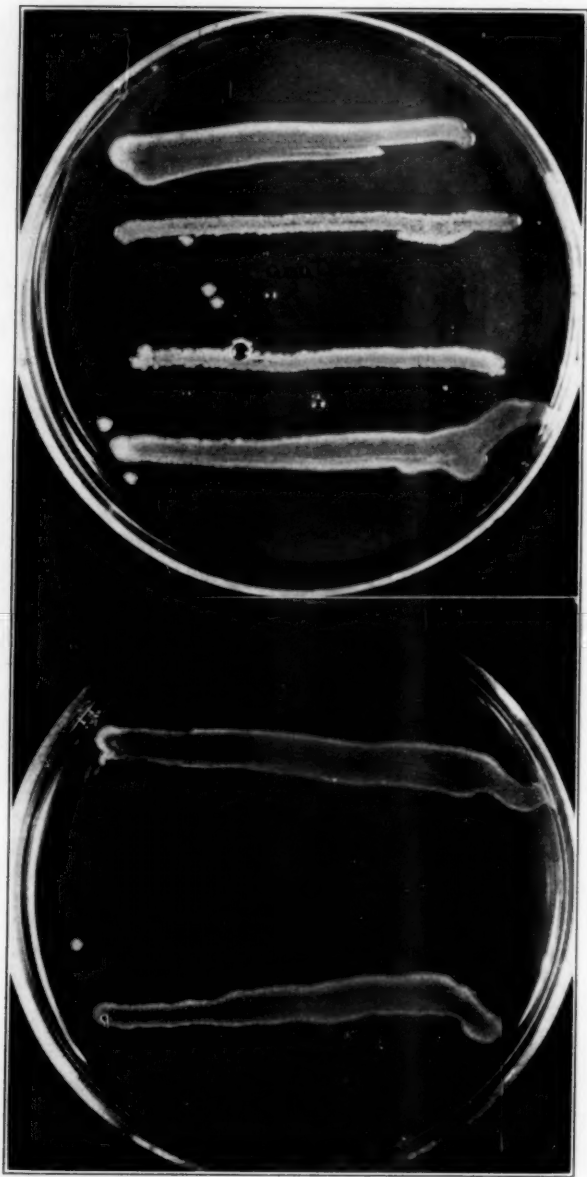


FIG. 3 (above). Effect of brilliant-green (1 to 100,000) liver-agar on *Salmonella anatum* and *Eberthella typhi*.

FIG. 4 (below). Growth of *Salmonella anatum* (upper-streak) and *Eberthella typhi* (lower streak) on plain agar, as compared with brilliant-green liver-agar (fig. 3).

of 24- and 48-hour intervals. All colonies were fished, except those that obviously resulted from contamination. These cultures were replated, to assure pure cultures, and then tested on glucose, mannitol, sucrose, maltose and lactose to determine their fermentative properties. Gram stains also were prepared. The pure cultures were smeared on plain liver-agar and brilliant-green (1 to 75,000 and 1 to 150,000) liver-agar to determine their resistance to the dye.

The plain liver-agar allowed the growth of numerous Gram-positive contaminants, spore-forming bacilli (spreaders) and Gram-positive cocci. In many instances, the growth of these contaminants would have precluded the growth of *Salmonella pullorum* and allied organisms. The brilliant-green liver-agar plates smeared from the same tissues were practically free from contamination. Gram-positive organisms, when they did appear, remained small, discreet colonies and appeared at the beginning point of the inoculation streaks where deposition of material from the tissues was heavy. It seems quite probable that this material acted as a source of food for these organisms or suppressed the bacteriostatic effect of the brilliant green. This is particularly true of the ovaries, when heavy depositions of egg-yolk occurred. The amount of contamination on the brilliant-green plates was extremely small in every instance and offered no hindrance to the development of the desired bacteria.

Heavy growths of *Escherichia coli* were obtained from 12 ovaries on plain liver-agar. In nearly every case, the development of *Escherichia coli* was so extensive that the development of *Salmonella pullorum* would have been impossible. Gross contamination by *Escherichia coli* is very common, especially when birds are killed before being shipped to the laboratory or die in transit.

In nearly every case, where *Escherichia coli* was found on the plain liver-agar, it was isolated also from the brilliant-green liver-agar. Here again, as in the case of the Gram-positive organisms, the amount of growth was scanty and limited to the beginning point of inoculation. It would not interfere in any manner with the isolation of *Salmonella pullorum*.

Salmonella pullorum was isolated from the ovaries of two birds. The amounts of growth on the plain liver-agar and the brilliant-green liver-agar were practically identical. No contamination was present on either set of plates.



FIG. 5 (above). Smear of liver from chick infected with bacillary white diarrhea, showing pure culture of *Salmonella pullorum* on brilliant-green (1 to 75,000) liver-agar.

FIG. 6 (below). Smear of same liver on plain liver-agar, showing gross contamination by spore-forming spreaders, which have suppressed the appearance of *Salmonella pullorum*.

The value of this medium is clearly demonstrated in figures 5 and 6. Smears were made from the liver of a chick infected with bacillary white diarrhea. The plain liver-agar plate was completely covered with Gram-positive spreaders, whereas the brilliant-green-liver-agar plate gave discreet colonies of *Salmonella pullorum* and no contamination. In our routine laboratory work we have had a number of similar instances, where the brilliant-green-liver medium gave pure cultures of *Salmonella pullorum* and the plain liver-agar was completely covered with *Escherichia coli* or Gram-positive spreaders.

As previously stated, *Escherichia coli*, from the tissues plated, grew to a slight extent on the brilliant-green medium. To determine their resistance to the dye, in pure culture, these organisms together with the Gram-positive spore-formers and cocci were smeared on brilliant-green (1 to 75,000 and 1 to 150,000) liver-agar. The effect of the liver infusion on the dye was determined also by including a set of brilliant-green (1 to 75,000 and 1 to 150,000) plain-agar plates. The results are given in table I.

Without exception, all of the Gram-positive bacilli and cocci were completely inhibited by the brilliant green in both the plain and liver-agar media. Both sets of control plates produced abundant growth with these organisms.

In the case of *Escherichia coli* and *communior*, the results were quite different. In every case these organisms grew on the brilliant-green agar medium. The growth, however, was scanty on the brilliant-green medium, whereas growth on the control medium was abundant.

The brilliant-green meat-extract agar produced less growth than the liver-agar, showing that the liver-agar contained some substance that causes a slight suppressive action of the brilliant green. Winslow and Dolloff, as previously mentioned, found that the addition of bile to brilliant-green lactose broth reduced the selective activity of the dye to a marked degree. It is quite possible that the liver contains a sufficient amount of bile salts to cause the reduction in activity observed in the experiments cited above. The suppressive action of the liver medium is so slight that it does not seriously interfere with the selective activity of the brilliant green.

The bacteriostatic quality of the brilliant green used was questioned, due to the fact that slight growths of *Escherichia coli* appeared in the presence of the dye.

TABLE I—Effect of brilliant green in plain extract-agar and liver-agar on pure cultures of organisms isolated from plates (both plain liver-agar and brilliant-green liver-agar) of chicken tissues

CULT.	KIND OF ORGANISM	GRAM STAIN	CONTROL		BRILLIANT-GREEN PLAIN-AGAR		BRILLIANT-GREEN LIVER-AGAR	
			PLAIN AGAR	LIVER AGAR	1-75000	1-750000	1-75000	1-150000
1	Bacillus	+	++++	++++	—	—	—	—
2	Bacillus	+	++++	++++	—	—	—	—
3	Bacillus	+	++++	++++	—	—	—	—
4	Bacillus	+	++++	++++	—	—	—	—
5	Bacillus	+	++++	++++	—	—	—	—
6	Bacillus	—	++++	++++	—	—	—	—
7	Bacillus	+	++++	++++	—	—	—	—
8	<i>E. communior</i>	—	++++	++++	±	++	±	+++
9	Coccus	+	++++	++++	—	—	—	—
10	Coccus	+	++++	++++	—	—	—	—
11	Coccus	+	++++	++++	—	—	—	—
12	<i>E. communior</i>	—	++++	++++	—	+	—	+++
13	<i>E. communior</i>	—	++++	++++	—	±	±	++
14	Bacillus	+	++++	++++	—	—	—	—
15	Bacillus	+	++++	++++	—	—	—	—
16	Coccus	+	++++	++++	—	—	—	—
17	Coccus	+	++++	++++	—	—	—	—
18	Coccus	+	++++	++++	—	—	—	—
19	Coccus	+	++++	++++	—	—	—	—
20	<i>E. communior</i>	+	++++	++++	—	+	±	++
23	<i>E. coli</i>	—	++++	++++	—	+	—	+
24	<i>E. coli</i>	—	++++	++++	—	—	—	+
26	<i>E. communior</i>	+	++++	++++	+	+	+	++
27	Bacillus	+	++++	++++	—	—	—	—
29	<i>E. coli</i>	—	++++	++++	+	++	++	+++
30	<i>E. coli</i>	—	++++	++++	+	++	±	++
31	<i>E. coli</i>	—	++++	++++	±	+	+	++
32	<i>E. coli</i>	—	++++	++++	+	++	++	+++
33	Coccus	+	++++	++++	—	—	—	—
34	Bacillus	+	++++	++++	—	—	—	—
36	Bacillus	+	++++	++++	—	—	—	—
37	Bacillus	+	++++	++++	—	—	—	—
38	Bacillus	+	++++	++++	—	—	—	—
39	Bacillus	+	++++	++++	—	—	—	—
40	Bacillus	+	++++	++++	—	—	—	—
41	<i>E. coli</i>	—	++++	++++	±	+	++	+++
43	Bacillus	+	++++	++++	—	—	—	—
44	Bacillus	+	++++	++++	—	—	—	—
45	Bacillus	+	++++	++++	—	—	—	—
46	<i>E. coli</i>	—	++++	++++	±	—	±	+++
47	<i>E. communior</i>	—	++++	++++	±	+	+	+++
48	<i>E. coli</i>	—	++++	++++	±	—	±	+++
887	<i>S. pullorum</i>	—	++++	++++	++++	++++	++++	++++
570	<i>S. pullorum</i>	—	++++	++++	++++	++++	++++	++++

++++ = abundant growth.

+++ , ++ , + = intermediate amount of growth.

± = very scanty growth.

— = no growth.

A new series of experiments was undertaken, using four dyes of different sources. Dye A was purchased from the National Aniline & Chemical Co., dye B from G. Gruber & Co., dye C from Coleman and Bell Co., and dye D from the Pure Products Co. Dye A was certified by the Society of American Bacteriologists. Dye D was used in all of the previous work presented in this paper. This dye was manufactured previous to the war.

RESULTS OF TESTS OF DYES FROM DIFFERENT SOURCES

It will be noted (table II) that dye A, a dye certified by the Society of American Bacteriologists, gives complete inhibition

TABLE II—Action of brilliant green obtained from various manufacturers on organism isolated from chickens

CULT.	ORGANISM	DYE A NAT'L ANILIN	DYE B GRUBER	DYE C COLEMAN & BELL	DYE D PURE PRODUCTS	CONTROL
8	<i>E. communior</i>	—	—	—	—	++++
12	<i>E. communior</i>	—	—	—	—	++++
13	<i>E. communior</i>	—	—	—	—	++++
20	<i>E. communior</i>	—	—	—	—	++++
23	<i>E. coli</i>	—	—	—	—	++++
24	<i>E. coli</i>	—	—	—	—	++++
26	<i>E. communior</i>	—	+	+	+	++++
29	<i>E. coli</i>	—	+	+	+	++++
30	<i>E. coli</i>	—	+	+	+	++++
31	<i>E. coli</i>	—	+	+	++	++++
32	<i>E. coli</i>	—	+	+	++	++++
41	<i>E. coli</i>	—	—	±	++	++++
46	<i>E. coli</i>	—	—	—	±	++++
47	<i>E. communior</i>	—	—	—	+	++++
48	<i>E. coli</i>	—	—	±	±	++++
887	<i>S. pullorum</i>	++++	++++	++++	++++	++++
570	<i>S. pullorum</i>	++++	++++	++++	++++	++++
550	<i>S. gallinarium</i>	++++	++++	++++	++++	++++
555	<i>S. gallinarium</i>	++++	++++	++++	++++	++++

++++ = abundant growth.

+++, ++, + = intermediate amount of growth.

± = very scanty growth.

— = no growth.

of *Escherichia coli* in a dilution of 1 to 75,000, whereas the German dye (B) and the two other American dyes (C and D) allow small amounts of *Escherichia coli* to develop. Dye D, the one used in the work previously cited in this paper, was the poorest dye of the four examined.

A series of tests was made upon colon organisms isolated from water supplies. *Escherichia coli* was inhibited by all three of the dyes tested. *Aerobacter aerogenes* grew to nearly the same degree on the brilliant-green medium as upon the plain liver-agar. These results confirm previous work by Rakieta and Rettger.

The best reaction for optimum bacteriostatic effect of the brilliant green was determined. Rakieta and Rettger claim that the reaction of the medium plays an important role in the activity of brilliant green when used in an enrichment medium. They found that the dye was active in an acid medium, but practically inert in an alkaline medium. They did not determine the effect of reaction upon a solid medium. To do this, a batch of liver-infusion agar was divided into three parts. These three portions were adjusted to different reactions, namely pH 6.6, 7 and 7.6. Brilliant green "D" was selected for use, as it allows a slight

TABLE III—Effect of reaction of medium upon brilliant-green (1-75,000) liver-agar

CULT.	ORGANISM	pH 7.6		pH 7		pH 6.6	
		BRILL- IANT GREEN	CONTROL	BRILL- IANT GREEN	CONTROL	BRILL- IANT GREEN	CONTROL
8	<i>E. communior</i>	±	++++	—	++++	±	++++
12	<i>E. communior</i>	±	++++	—	++++	—	++++
13	<i>E. communior</i>	±	++++	—	++++	±	++++
20	<i>E. communior</i>	±	++++	—	++++	±	++++
23	<i>E. coli</i>	±	++++	—	++++	—	++++
24	<i>E. coli</i>	—	++++	—	++++	—	++++
26	<i>E. communior</i>	+	++++	+	++++	+	++++
29	<i>E. coli</i>	++	++++	+	++++	++	++++
30	<i>E. coli</i>	++	++++	+	++++	±	++++
31	<i>E. coli</i>	++	++++	++	++++	+	++++
32	<i>E. coli</i>	++	++++	++	++++	++	++++
41	<i>E. coli</i>	+	++++	++	++++	++	++++
46	<i>E. coli</i>	±	++++	±	++++	±	++++
47	<i>E. communior</i>	±	++++	+	++++	+	++++
48	<i>E. coli</i>	±	++++	±	++++	++++	++++
570	<i>S. pullorum</i>	++++	++++	++++	++++	±	++++
887	<i>S. pullorum</i>	++++	++++	++++	++++	++++	++++

++++ = abundant growth.
 +++, ++, + = intermediate amount of growth.
 ± = very scanty growth.
 — = no growth.

growth of *Escherichia coli*. Any effect of reaction of media would be readily discerned by the differences in amount of growth produced. A 1-to-75,000 dilution of the dye was used as in previous experiments.

The reaction of the medium (table III) has only a slight effect upon the inhibitory action of the brilliant green at the reactions tested. The best results were obtained at pH 7, but the difference is not marked. It would seem that on a solid medium, at least, where the organisms are smeared over the

surface of the medium, the reaction of the medium would have little, if any, significance.

During the course of the study presented, it was observed that the brilliant-green solution showed a decline in bacteriostatic power after the solution was a month or more old. This is illustrated by the following data: A freshly prepared solution inhibited the development of *Escherichia coli* in a dilution of 1 to 150,000, while a solution a month old inhibited only in a dilution of 1 to 50,000. The necessity of fresh stock solutions is clearly demonstrated.

DISCUSSION

A selective medium for the isolation of *Salmonella pullorum* is presented. This medium inhibits the development of Gram-positive bacteria and *Escherichia coli* without any appreciable inhibition of *Salmonella pullorum* and other avian members of the paratyphoid group.

Although liver-agar is recommended for use with the brilliant green, any other agar base will serve equally well. Liver-agar was selected, because of the enhanced growth that results. Any medium used should have a reaction of pH 7, since at this titre the dye appears to be at its optimum bacteriostatic power.

The dye used should be standardized as to the dilution that gives maximum selective action without any appreciable inhibition to the paratyphoid organisms. A dilution of 1 to 75,000 generally gives the best results, although in all instances dilutions of 1 to 50,000 to 1 to 200,000 should be tested. The highest dilution giving optimum relative properties should be selected for use.

A stock solution of the dye should be prepared at least once a month and stored in the ice-chest. Brilliant green loses its bacteriostatic properties upon standing in solution. The cause of this deterioration is not known.

CONCLUSIONS

Brilliant green, when added to nutrient agar, allowed unrestricted growth of *Salmonella pullorum*, *Salmonella gallinarum* and all other members of the paratyphoid group.

Brilliant green had a selective inhibitory effect upon *Escherichia coli*, as previously pointed out by Torrey.

Brilliant green inhibited the growth of Gram-positive organisms found as contaminants in the usual autopsy plates.

A brilliant-green liver-infusion agar is recommended for the isolation of *Salmonella pullorum* and allied organisms from tissues of autopsied chickens, particularly baby chicks.

Brilliant green was the only dye of those tested that exhibited selective bacteriostatic action among the colon-typhoid intermediates.

The bacteriostatic effect of brilliant green obtained from various manufacturers gave decided variations.

Stock solutions of brilliant green deteriorated, upon aging, in their bacteriostatic effect. Fresh solution or one not more than four weeks old should be used.

REFERENCES

- ¹Cornil and Baber: Cited by Jansen (1914). Jour. Inf. Dis., xiv (1890), p. 255.
- ²Conradi and Drigalski: Ztschr. f. Hyg., v (1902), p. 283.
- ³Torrey: Jour. Inf. Dis., xiii (1913), p. 263.
- ⁴Winslow and Dolloff: Jour. Inf. Dis., xxxi (1922), p. 303.
- ⁵Rakieten and Rettger: Jour. Inf. Dis., xli (1927), p. 93.
- ⁶Huddleson: Jour. Inf. Dis., xl (1927), p. 352.

BANQUET IN HONOR OF DR. JAMES FLEMING

On September 7, 1928, the employes of the U. S. Bureau of Animal Industry tendered a banquet to Dr. James Fleming, who had been inspector-in-charge of federal meat inspection at Kansas City since 1910. The "fill" was served in the Aztec Room of the Hotel President. Dr. Fleming had been ordered to report at Clifton, N. J., to take charge of the United States quarantine station at that point, effective September 15. A large percentage of the meat inspection and virus-serum control forces of Kansas City were present with representatives of the other activities of the Department of Agriculture at Kansas City. Bureau employes from Topeka, Kansas; St. Joseph, Missouri, and other places also attended. The large attendance, good fellowship and speeches of appreciation and commendation of Dr. Fleming testified to the high esteem in which he is held by all of his associates.

According to a copy of the banquet program, kindly forwarded by Dr. Jos. W. Parker, Dr. G. E. Maxwell officiated in the capacity of "yarder" and called upon the following for after-dinner speeches:

- "Anaphylaxis," Dr. J. B. Thompson.
- "In Sweet Pickle," Mr. A. C. Stadler.
- "Graphite Grindings," Mr. S. M. Miller.
- "Concentrated Serum," Dr. F. A. Imler.
- "The Big Squall," Mr. P. Connor.
- "L'Envoi," Dr. N. L. Townsend.

THE ACCURACY OF THE AGGLUTINATION TEST IN THE DIAGNOSIS OF BACILLARY WHITE DIARRHEA*

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Practically every one of the serological tests which have been widely used in the diagnosis of human and animal diseases has met criticism at the hands of certain investigators. Recently these criticisms have been based upon data collected by sending portions of samples of serum to several laboratories for diagnosis. The results of these procedures have not always been encouraging. Among the diagnostic tests which have been subjected to such analysis are the Wasserman reaction and the agglutination test for the detection of bovine infectious abortion. Gilbert and Langworthy¹ reported upon a number of samples of serum sent to different laboratories to be tested for syphilis. The results of these tests were quite variable, only 66 per cent correlation being obtained. The agglutination test for bovine infectious abortion has met severe criticism from various workers. Yet today these two serological tests are accepted as being of great value in the detection of disease and their application for the determination of infection is very widely practiced.

During the past year Beach and Merrick² published the results obtained by sending samples of chicken serum to six laboratories to be tested for bacillary white diarrhea. The results of this comparison were far from encouraging. The sera of 38 hens were sent to the six laboratories. In only five samples were the reports identical. Other similar tests reported by the same investigators agreed no more closely than the above.

The purpose of the present paper is to give the results of tests conducted in a manner similar to those of Beach and Merrick. The tests were carried out as follows: Twenty-four hens which were being used in experimental work were bled from the wing vein, the blood placed in the ice-box over night and the serum drawn off the following morning. The sera were divided into eight equal parts. Seven portions of each serum were placed in

*Published by permission of the Director of the Kentucky Agricultural Experiment Station. Received for publication, April 16, 1928.

small bottles and preserved by the addition of crystals of thymol. The eighth portion was used to set up agglutination tests in this laboratory. One portion of each of the preserved sera was sent to the following investigators: Dr. H. J. Stafseth, Dr. L. F. Rettger, Dr. F. R. Beaudette, Dr. W. R. Hinshaw, Dr. M. Scherago, Dr. A. J. Steiner and Dr. Frank Hare. Each of these workers subjected the sera to the agglutination test for bacillary white diarrhea.

TABLE I—Results of agglutination tests of same sera by different laboratories

BIRD No.	LABORATORY NUMBER							
	1	2	3	4	5	6	7	8
H49	—	—	—	—	—	—		—
H62	—	—	—	tr	—	—		—
H71	—	—	—	—	—	—		—
44	+	+	+	+	+	+	+	+
F100	+	+	+	+	+	+		+
H293	+	+	+	+	+	+	+	+
H310	+	+	+	+	+	+	+	+
H413	+	+	+	+	+	+	+	+
H416	+	+	+	+	+	+	+	+
H421	+	+	+	+	+	+	+	+
H454	+	+	+	+	+	+	+	+
H472	+	+	+	+	+	+	+	+
H479	+	+	+	+	+	+	+	+
H484	+	+	+	+	+	+	+	+
H488	+	+	+	+	+	+	—	+
H489	±	+	+	+	+	+		+
H505	+	—	+	+	+	+	+	+
H626	+	+	+	+	+	+		+
J997	±	+	+	+	+	+		+
2471	+	+	+	+	+	+	+	+
2491	—	+	+	+	+	—		+
2495	+	+	+	+	+	+	+	+
A5903	+	+	+	+	+	+		+
A5952	—	—	—	±	—	—		±

tr = Trace of an atypical reaction.

± = Partial reaction.

The results of these tests, which are given in table I, are very uniform. Laboratory 1 reported one sample as negative which the majority of the workers reported positive. Laboratory 2 also reported one sample negative which the majority found positive. Laboratory 3 and Laboratory 5 agreed with the majority report in every instance. Laboratory 4 reported one sample as a partial reactor which the majority of the workers reported negative. The same laboratory reported an atypical trace of reaction in a sample which the majority reported negative. Laboratory 6 reported one sample negative which the

majority of workers reported positive. This sample (2491) was the same as that reported negative by Laboratory 1. Laboratory 7 tested only fourteen samples of the serum, finding ten samples unfit to test. This laboratory reported one sample negative which the majority reported positive. Laboratory 8 reported one sample as a partial reactor which the majority of the workers found negative. If the majority report be taken as correct in each instance the agreement of the eight laboratories for the twenty-four samples is 96.1 per cent.

In justice to the investigators taking part in this work, it should be stated that the samples were not in the best of condition when shipped. The addition of thymol caused, in some instances, a heavy white precipitate, which made the tests very difficult to read. In every case in which a laboratory reported a bird negative while the majority report was positive, that sample of serum was markedly cloudy so that a perfectly satisfactory reading could not be obtained.

In addition to the difficulties cited above, there is still another factor which must be considered in work of this kind. The agglutinins in fowl serum acting upon *Bact. pullorum* are not nearly so active after preservatives are added to the serum. Our tests of serum which has been preserved, shipped to distant points and returned to this laboratory have demonstrated this fact. So that when we consider the effect of preservation upon the agglutinins for *Bact. pullorum*, it may be easily understood why discrepancies appear in such comparisons. There is no doubt whatever that could the workers taking part in this study have tested these samples of serum when fresh and unpreserved, the results would have been even still better. The difficulties under which they were working are shown by the fact that one laboratory found ten of the samples in such bad condition that they could not be tested. The samples received by the other investigators also were in poor condition for testing.

It has been demonstrated by the writers³ and by numerous other investigators that hens reacting to the agglutination test are carriers of *Bact. pullorum*. Therefore, it is the writers' opinion that these results demonstrate that the agglutination test for the detection of bacillary white diarrhea is an accurate method of diagnosis. It is extremely unfortunate that the work of Beach and Merrick² has been given wide publicity by certain commercial hatcheries and other persons who are seemingly

interested in discrediting the agglutination test. In this test we have a specific method for the determination of infection in breeding stock. A great mass of data has accumulated through the work of a large number of investigators during the past fifteen years. The work of these men has demonstrated that by careful application of the agglutination test, baby-chick losses from this infection can be controlled and the disease finally eradicated from breeding flocks. Again we say that it is extremely unfortunate that one piece of work, the results of which were anything but uniform, should have been taken as being representative of the accuracy of the agglutination test when there are innumerable instances of previous work, all tending to show that the agglutination test is an unusually accurate method of diagnosing bacillary white diarrhea. The erroneous conclusions drawn from the work of Beach and Merri-
rick by the commercial poultrymen will tend to delay the eradication of one of the most destructive diseases with which the poultryman must cope.

The agglutination test has placed in the hands of the poultry disease investigator a means of controlling bacillary white diarrhea. It is the commercial hatchery which is distributing diseased chicks and which is unwilling to incur the trouble and expense of testing, that would have the farmer believe that the control of the disease by the blood test is impractical. Commercial hatcheries have increased in number until the traffic in baby chicks is enormous, yet no regulations have been generally adopted to prevent the spread of disease by these agencies. The distribution of baby chicks has become the chief source of the spread of bacillary white diarrhea. No other live stock industry enjoys the freedom from regulatory measures that is possessed by the commercial hatcheries. Yet many hatchery operators endeavor to impress upon their customers that the agglutination test is worthless in the prevention of bacillary white diarrhea, and its application a detriment rather than a benefit.

It is to be hoped that the buyer of baby chicks may be brought to the realization that his losses may be materially reduced through careful and systematic application of the agglutination test. Then the buying public will demand chicks from stock which have been tested by a competent operator and the

control and eradication of the disease will go forward at a much faster rate.

In conclusion the writers wish to thank the investigators who collaborated in this work, and made the comparative tests possible.

REFERENCES

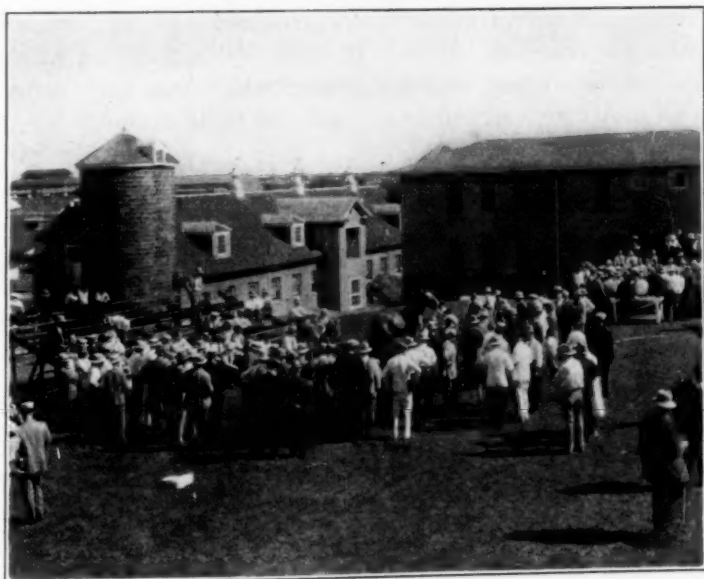
¹Gilbert, L., & Langworthy, V.: Paper presented at meeting of American Public Health Association, 1927.

²Beach, B. A., & Merriek, A. C.: Amer. Poul. Jour., lviii (1927), pp. 404-405.

³Edwards, P. R., & Hull, F. E.: A comparison of the agglutination test and the intradermal test in the detection of bacillary white diarrhea. Jour. A. V. M. A., lxxi (1927), n. s. 24 (5), pp. 590-599.

WHEN DISASTER RIDES THE SKIES

The poster which Chapters of the American Red Cross will display throughout the country from November 11 to 29, inviting the people to join the Red Cross for another year, symbolizes the services of relief and rehabilitation provided by the "Greatest Mother" when disaster strikes. Throughout the past year the Red Cross has been engaged continually in disaster relief work at home and has extended assistance in many catastrophes abroad. The poster reproduced in the advertising section of this issue of the JOURNAL, was painted by Cornelius Hicks.



THE A. V. M. A. CLINIC AT UNIVERSITY FARM
A view of the large-animal clinic.

COMPARISON OF TUBE AND SLIDE AGGLUTINATION TESTS FOR BACILLARY WHITE DIARRHEA*

By L. D. BUSHNELL and C. A. BRANDLY, Manhattan, Kansas

INTRODUCTION

The agglutination test for bacillary white diarrhea has come into very wide use during the past two years as a means of detecting infected birds. The tube method has been used almost exclusively until the past year and has given excellent results, as indicated by reports from many parts of the country. That it has occasionally led to false conclusions is also evident from numerous reports in the literature. The very fact that there is frequently a discrepancy in the reports upon the same material tested by this method from different laboratories leads to considerable doubt that such a test will ever come into general use and be free from serious criticism. For this reason a test not open to so much criticism should be sought.

In this laboratory we have been making a comparison of the various methods which have been recommended for this test. After several months of rather intensive study we are making this short report on the results obtained by comparing the tube agglutination test and the rapid slide-test.

Huddleson and Carlson¹ have modified the agglutination technic for infectious abortion in cattle by introducing a rapid slide method. They used an antigen which was very concentrated and which contained 12 per cent sodium cholrid (c. p.) and 0.5 per cent phenol.

Runnells, Coon, Farley and Thorp² developed a rapid method of testing fowl blood based on the technic of Huddleson and Carlson. This consisted in using an antigen about 50 times as concentrated as that used in the tube-test and containing 12 per cent sodium chlorid. To 0.02 cc of this concentrated antigen they added 0.01 and 0.02 cc of serum. The mixtures were warmed gently and agitated for a few minutes. In the presence of positive sera there was a rapid and complete agglutination of the antigen.

There are several advantages to this method. It requires less equipment and gives immediate results. It also avoids the trouble from contamination which has been described by Hin-

*Contribution No. 105, Department of Bacteriology, Kansas Agricultural Experiment Station. Received for publication, May 2, 1928.

shaw and Dunlap³ and which we believe has been one source of the differences reported on the same sample of serum by different laboratories.

PREPARATION OF THE ANTIGEN

One of the most important and also the most difficult parts of the technic of this test is the preparation of a suitable antigen. The cultures used were all typical of the organism and kept in vigorous growing condition by frequent transfer to fresh media. These were frequently tested for purity and ability to undergo agglutination by known positive sera. None of the cultures used showed spontaneous agglutination.

The antigens used by us were prepared by growing the organism on beef-extract agar prepared by using Difco standardized peptone and 0.2 per cent sodium citrate and adjusting the reaction to pH 7.0. The organisms were grown for about 24 hours at 37° C., suspended in physiological salt solution and washed twice. The sediment was then suspended in a sufficient amount of 12 per cent sodium chlorid solution to make the resulting antigen 50 times as concentrated as that used in the tube method. At first we used only freshly prepared antigen to which no phenol was added. Later antigens containing 0.5 per cent phenol were used but the results were not always so good as when fresh antigens were used.

METHOD OF CONDUCTING TESTS

The technic of the test is similar to that used by Runnells et al, except that we have used a single dilution of about 1:25. It consists of placing two drops of clear serum of uniform size on various ruled areas of a glass plate and adding to these a drop of concentrated antigen of equal size. The plate is warmed gently and tilted from side to side to mix the serum and antigen. The ingredients may be stirred together but this is not necessary. The readings are always taken within three minutes, and preferably within two minutes after adding the antigen to the serum. If the mixing is continued too long there are some tests which show a slight clumping. In such instances the reading may not agree with the tube-test while those read within three minutes agree very well.

There are very few borderline reactions if the antigen is correctly prepared and the incubation of the test is not too long. We have found occasional samples of serum which do not give

a reaction to the rapid method but which react in the tube-test. Retests on many of these samples gave the same results. This is a point which cannot be fully explained but is due apparently to some peculiarity of the concentrated antigen which delays the reaction.

RESULTS OBTAINED

Up to the present time we have compared 5029 tests by using the tube method as standard and exercising great care to avoid growth of organisms in the tests. This has been accomplished during part of the work by incubating the tests at 45° C. in the absence of pœnol.

Of the tests made, 978 (19.2%) were reactors by the tube method. Comparing the results by the Yule method there is found to be an association coefficient of .099+. The results are recorded in the following summary:

	Number	%
Positive to tube and positive to rapid	891	17.7
Negative to tube and negative to rapid . . .	2956	78.7
Positive to tube and negative to rapid . . .	87	1.7
Negative to tube and positive to rapid . . .	95	1.9
Association coefficient—0.99+.		

An association coefficient of 0.99 is very high. In only 3.6 per cent of the tests was there a disagreement. This disagreement was due to the fact that 87 of the tests which were positive to the tube method were negative to the slide method. There were also 95 tests positive to the slide method which were negative to the tube method. In many cases these tests were repeated the next day with similar results. This leads to the belief that these differences are not due to avoidable technical difficulties, but to differences in actual reaction.

The significance of these differences is not known. In numerous cases we have found, as others have reported, that some reactors show no visible lesions of the disease while in some cases the organism may be isolated from birds which do not react to the test.

However, we have considerable statistical evidence in our files which indicates that culling reactors to the tube agglutination test over a period of years will finally eradicate the disease from a flock. If this is the case the data submitted indicate that the

rapid method of detecting reactors should be equally as effective as the tube method.

SUMMARY

We may summarize our findings by saying that the rapid slide-test, using concentrated antigen and a short incubation period, may replace the tube agglutination test for detecting carriers of bacillary white diarrhea. A freshly prepared antigen has given much better results than one which has been kept for several days even in the ice-box. The dilution should be retained at 1 to 25, as has been recommended for the tube-test.

REFERENCES

- ¹Huddleson, I. F., & Carlson, E. R.: A rapid method for performing the agglutination test in the serum diagnosis of Bang's abortion disease in cattle. Jour. A. V. M. A., lxx (1926), n. s. 23 (2), pp. 229-233.
²Runnells, R. A., Coon, C. J., Farley, H., & Thorp, F.: An application of the rapid-method agglutination test to the diagnosis of bacillary white diarrhea infection. Jour. A. V. M. A., lxx (1927), n. s. 23 (5), pp. 660-662.
³Hinshaw, W. R., & Dunlap, G. L.: Atypical *Salmonella pullorum* agglutination caused by bacterial contamination. Jour. A. V. M. A., lxi (1928), n. s. 25 (5), pp. 594-598.

CONVENTION NOTES

State veterinarians were in plentiful supply. Among those present were: Cary, of Alabama; Bux, of Arkansas; Knapp, of Florida; Brown, of Indiana; Malcolm, of Iowa; Killham, of Michigan; Cotton, of Minnesota; Rafnel, of Mississippi; Hays, of Nebraska; Moore, of North Carolina; Crewe, of North Dakota; Lytle, of Oregon; Munce, of Pennsylvania; Ray, of South Dakota; Lincoln, of Tennessee; Williams, of Texas; Givens, of Virginia, and Case, of Hawaii.

Six members were present from the District of Columbia representing various branches of the government service. These included Dr. J. R. Mohler, Chief of the Bureau of Animal Industry; Dr. A. E. Wight, Chief of the Tuberculosis Eradication Division of the B. A. I.; Dr. E. W. Price, of the Zoological Division of the B. A. I.; Dr. H. E. Moskey, of the Food, Drug and Insecticide Administration; Dr. J. E. Shillinger, of the Bureau of Biological Survey, and Major R. A. Kelser, of the Veterinary Corps of the Army.

Ohio veterinarians turned out in force. Those present included: Drs. H. E. Ash, Bowling Green; W. A. Axby, Harrison; C. H. Case, Akron; H. H. Fairbank, Leonard W. Goss, J. D. Grossman, W. H. McKenzie, D. M. Swinehart and D. S. White, of Columbus; C. A. Fast, Van Wert; C. W. Fogle, Leipsic; Reuben Hilty, Toledo; E. V. Hover, Lima; A. J. Kline, Wauseon; J. H. Lenfestey, Lyons; George Place, St. Marys; R. S. Smiley, Cromers, and E. Ziegenbusch, Delphos.

STUDIES ON A GROSS NO-LESION TUBERCULIN REACTOR

By H. E. BIESTER and CHAS. MURRAY

Veterinary Investigation Department, Ames, Iowa

The problem of no-lesion reactors in cattle is one which is of considerable interest from the standpoint of pathology, meat inspection and tuberculosis eradication. The following case is deemed worthy of record because of the obscurity of the early lesions, no tubercles being visible after a careful gross examination. Animal inoculation of suspected material from the subject also gave negative results.

An Angus bull calf was purchased with the intention of feeding and preparing it for the show-ring as a steer. Two tuberculin tests and a 60-day quarantine are required for admission to the herd to which it was to be added. On November 11, 1926, the first tuberculin test (intradermal) was negative, after which the animal was castrated and placed in quarantine. On January 10, 1927, at the end of the 60-day quarantine period, the steer reacted to the second tuberculin test and was slaughtered under local inspection on January 19, nine days after reacting. At this time the subject was ten months old and weighed 423 pounds.

A detailed meat inspection was performed. The hide was carefully examined and the cadaver was minutely inspected. After its division into the various cuts, further examination was made. A composite sample of some of the deeper lymph-nodes was injected into guinea pigs and rabbits with negative results. The only gross alterations noted were two moderately enlarged, reddened mesenteric lymph-nodes in the jejunal region. These two nodes were freely incised. They presented a congestion with minute hemorrhages. No gross tubercles nor necrosis were found after numerous closely placed incisions with critical examination under a strong light.

The internal organs were ribboned and subjected to careful autopsy technic, but gross lesions were not found. The reddened jejunal mesenteric lymph-nodes referred to above were divided into two nearly equal parts, one portion for animal inoculation and the other for embedding and histopathologic study. This was done by taking alternate sections for each purpose. The one portion was placed in a refrigerator overnight and the follow-

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ing day was ground up in a mortar and injected into two guinea pigs and two chickens. The other half was fixed in formalin and embedded in paraffin.

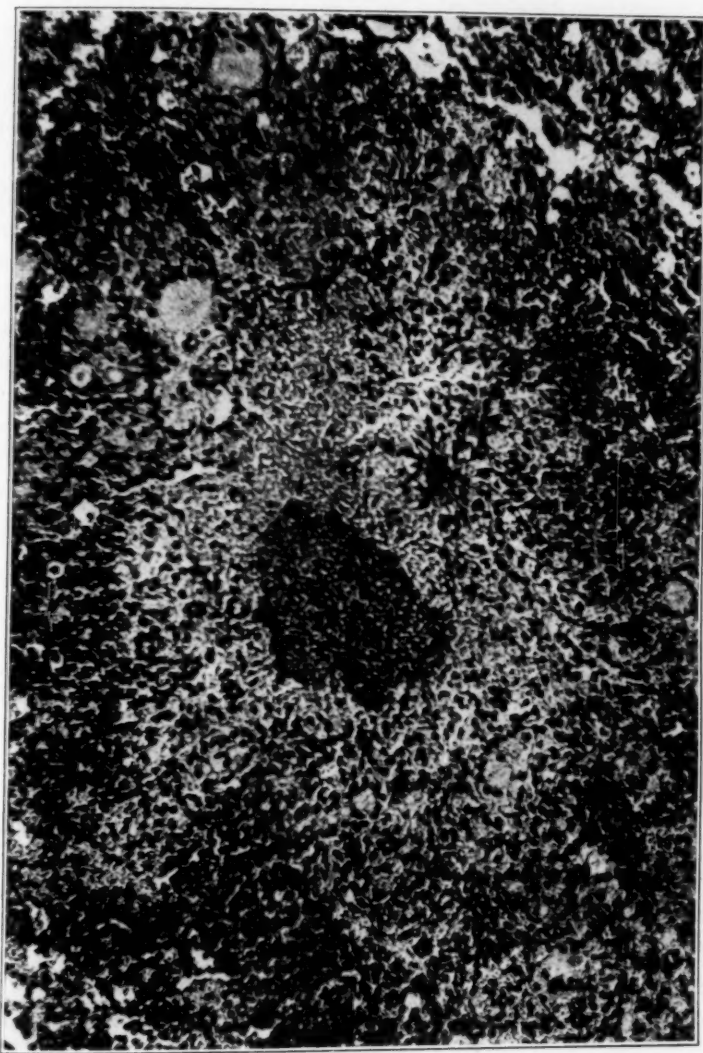


FIG. 1. Mesenteric lymph-node from steer, showing tubercle. $\times 200$.

Scrapings from cut surfaces for direct microscopic examination were taken after the incisions and gross observations were made. A complete search of the first six large direct smears showed no acid-fast bacilli. The following two direct smears contained

acid-fast bacilli although no lesions other than hyperemia were discernible on any of the surfaces from which scrapings for smears were taken. The injected guinea pigs were allowed to live about four months after injection of the suspected material. They did not lose weight nor show lesions at autopsy. One chicken succumbed during an outbreak of tracheitis, before the lapse of sufficient time for the possible development of lesions. The other chicken was destroyed sixty-eight days after injection of the lymph-node material but no lesions were present.

Microscopic sections were made of a number of embedded blocks from the lymph-nodes of the steer, resulting in no unusual observations. However, on cutting one block, a very fine, pin-point area on the ribbon drew attention. Microtome sectioning was continued and the focus of different texture increased slightly in size, after which two almost invisible foci appeared. This block was cut to its base but no further foci appeared after these had been passed. Stained by routine hematoxylin and eosin method, these minute areas were found to be tubercles showing early caseation, karyorrhexis, epithelioid-cell infiltration, congestion and giant cells present. The largest lesion (fig. 1) was about one-third millimeter in diameter, as determined from a x200 photomicrograph. That part of the lesion which was visible grossly seemed smaller.

The same histologic section also contained large areas of epithelioid cells, congestion and small pools of red blood-cells (fig. 2), similar to the areas adjacent to the tubercles. Other blocks showed similar cellular proliferation, congestion and extravascular blood, but no microscopic tubercles. Histologic sections five and six micra thick were stained by the acid-fast method. Numerous acid-fast organisms were found in the three minute tubercles described (fig. 3). In section the organisms appeared short and plump. Acid-fast organisms as demonstrated in the histologic sections were confined to the three tubercles. As the edges of the tubercles were reached in the serial sections no bacilli were found. A careful search of all other sections from different embedded blocks revealed no organisms in any of the areas of epithelioid-cell reaction, congestion and extravascular blood.

The demonstration of organisms in tissues by direct microscopic search, while a highly technical procedure, is in reality a crude diagnostic armamentarium when it is considered how infinitesimally small a part of the material being examined can

be seen in each field of the microscope. Diagnosis of tuberculosis by animal inoculation is generally considered the final and most dependable method, especially when other methods have proven



FIG. 2. Mesenteric lymph-node from steer, showing focal hemorrhage and some epithelioid cells, with absence of acid-fast organisms in such areas. x 450.

insufficient. However, in this instance the direct microscopic method prevailed over the more generally accepted injection method.

Failure to demonstrate tubercle bacilli by inoculation tests has been explained in some cases by an apparent lack of virulence for the test animals, death of the organisms in lesions that are healing and by absence of organisms from the material used for injection or presence in such numbers as not to be infectious. The lesions under consideration were active and gave no indications of healing. Therefore, it can be assumed that we were not dealing with dead bacilli. Some of the other factors cannot be ruled out, but the histologic study seems to indicate that possibly the acid-fast organisms were confined to a rather small area, which happened to be selected only with the material for microscopic study. If bacilli were present in other portions of the lymph-nodes, their numbers were too small for demonstration by any method.

A consideration of experimental lesions would suggest that those described in this report were of not less than thirty days' duration. When tubercle bacilli become lodged in tissues, a microscopic reaction between bacilli and the cellular elements results, involving chiefly the leucocytic cell types. Medlar^{1,2} experimentally traced the body responses to the intravenous introduction of tubercle bacilli. Ten days after such inoculation not even microscopic tubercles had formed in the spleen. A careful microscopic study may show single tubercle bacilli or groups of two or three bacilli in the Malpighian corpuscles. The bacilli were usually within leucocytes but some seemed to be extracellular. In his fifteen- and twenty-day specimens the reaction consisted almost entirely of mononuclear leucocytes. He refers to this change as the mononuclear of "epithelioid" tubercle. No caseation is present. At twenty-five days, after introduction of the organism, the presence of polymorphonuclear leucocytes becomes marked. The process of caseation does not take place until the polymorphonuclear infiltration has advanced. In the reported case the process of caseation was present, although it had not yet advanced to the center of the largest of the three minute tubercles found.

Experimental work³ has shown that cutaneous hypersensitization may appear the seventh or eighth day after the injection of bacterial filtrates. When this fact is borne in mind in considering the nature and development of the tuberculous lesion, it can readily be seen that we are dealing with a change that may prove difficult or impossible of demonstration, especially if attention is not directed to an individual node or area, thus necessitating

a search extending throughout a subject usually weighing five hundred pounds or more. Where a large number of animals are inspected it would not be feasible to devote unlimited time to each subject in a search for organisms. Nearly three hours were consumed in searching the direct smears, while the histologic studies required more than that number of days. If the scrapings had been taken from other places, even with this expenditure of time the bacilli might have been overlooked.

The difficulties encountered in demonstrating lesions and organisms would no doubt have been greatly increased if the

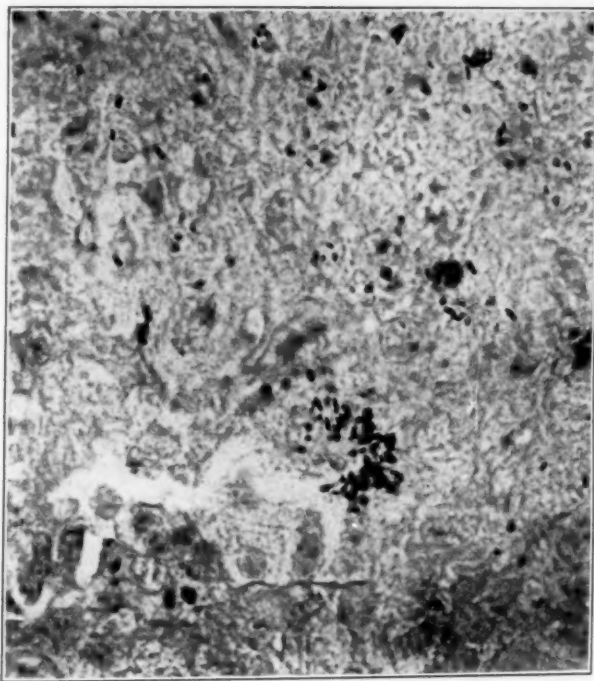


FIG. 3. Mesenteric lymph-node from steer, showing acid-fast organisms in tubercle. $\times 900$.

second test had been performed three or four weeks earlier and the animal destroyed then, when changes were undoubtedly made up of reactions between a smaller number of bacteria and cells. It should also be noted that nine days had elapsed from the date of the positive tuberculin test to the time of slaughter and inspection, giving the process that much more time to progress. As exposure to the infection is lessened by the removal of reactors

at regular intervals, the resulting lesions would be on a smaller scale, which may account for an increase in the percentage of so-called no-lesion reactors. The classification of a case as a "no-lesion" reactor should carry with it the responsibility of having eliminated even so much as the cellular changes resulting from a reaction between a few cells and a few bacilli, if such a premise could be proved. In any event, when it is considered how soon after the introduction of the organisms cutaneous sensitization takes place, the term "no-lesion" reactor should not be construed too literally.

REFERENCES

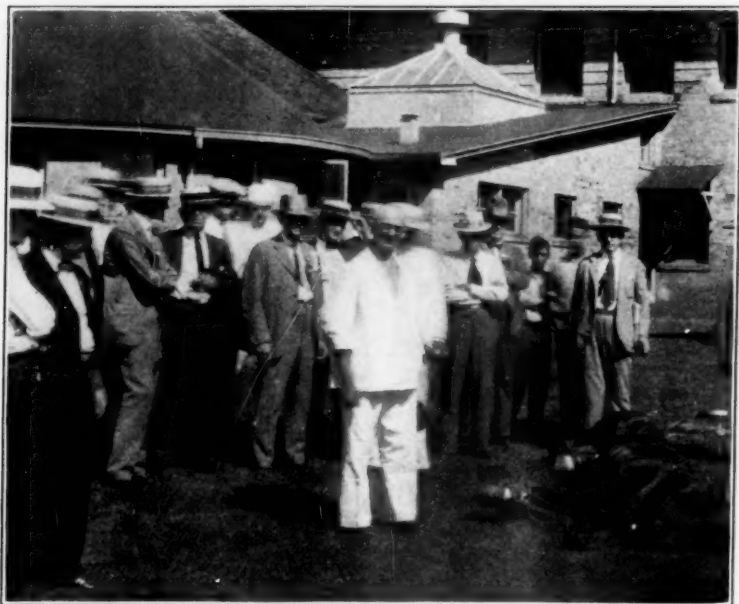
- ¹Medlar, E. M.: A study of the process of caseation in tuberculosis. *Amer. Jour. Path.*, ii (1926), p. 275.
²Borrel, A.: Etude anatomo-pathologique du processus obtenu par injection veineuse. *Ann. de l'Inst. Pasteur*, vii (1893), p. 593.
³McJunkin, Frank A.: Tuberculin hypersensitiveness in non-tuberculous guinea pigs induced by injections of bacillus-free filtrates. *Jour. Exp. Med.*, xxxiii (1921), p. 751.

BUREAU TRANSFERS

Dr. Geo. H. Starr (McK. '17) from Pottsville, Pa., to National Stock Yards, Ill., on meat inspection.

Dr. Orley J. Mayfield (Iowa '28) from Kansas City, Mo., to Indianapolis, Ind., on virus serum control.

Dr. J. A. Skordahl (St. Jos. '19) from Milwaukee, Wis., to Sioux City, Iowa, on meat inspection.



THE A. V. M. A. CLINIC AT UNIVERSITY FARM
Dr. "Tom" Sigler was a busy man.

GASTRO-INTESTINAL PARASITES OF EQUINES AND CONTROL MEASURES*

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INTRODUCTION

Horses probably harbor more species of parasites than any other domestic animal. In 1911 Geddoelst¹ recorded 224 species of zooparasites for the horse, 38 species for the ass, and 34 species for the mule. Many new species have been added to these lists since 1911 and it is probable that the number of species of animal parasites known from equines at the present time is close to 300. Animal parasites of equines include Protozoa, trematodes, cestodes, nematodes and arthropods, and are reported from various locations on and in the body, including various parts of the skin, subcutaneous tissue, musculature, tendons and ligaments, frontal sinus, mouth and pharynx, esophagus, stomach, small intestine, large intestine, liver, peritoneum, nasal cavities, bronchi, lungs, arteries, blood, kidneys, testes, brain, eye and other organs and tissues.

Over 100 species of worm parasites have been reported from horses and of these the vast majority occur in the digestive tract. While in certain parts of the world, especially in the tropics, trypanosomes overshadow in importance all other equine parasites, in the United States and in practically all other temperate regions the parasites which occur in the gastro-intestinal tract of these animals demand first consideration. With a few exceptions, the parasites of the gastro-intestinal tract have a direct life history, this factor commonly tending to produce gross infestations with resultant disturbances in digestion, irritation and inflammation of the mucosa of the alimentary canal, anemia due to the abstraction of blood by blood-sucking species and also, probably, to secondary causes, and other pathological conditions commonly associated with the gross invasion of the alimentary canal by parasites.

For the sake of convenience gastro-intestinal parasites of horses may be grouped in accordance with their position in the alimentary canal as follows: (1) parasites of the stomach, includ-

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ing botfly larvae and stomach-inhabiting nematodes; (2) parasites of the small intestine, including certain tapeworms and the ascarids or large intestinal round worms; and (3) parasites of the large intestine, including the well-known blood worms (also known as red worms or palisade worms), the small strongyles, the pinworms and one tapeworm.

BOTFLY LARVAE

Three species of botflies, the maggots of which are parasitic in the stomach of equines, occur in the United States. These are briefly noted as follows:

The common botfly, *Gastrophilus intestinalis*, is the best known and most widely distributed species and occurs in practically all parts of this country. The parasitic larvae of this species are the largest bots which occur in equines and usually have a reddish color. They attach to the white covering of the left or non-glandular sac of the stomach or along the ridge between the right, or glandular, and left sac of the stomach. The adult of this maggot is the least annoying adult of the three species of botflies, as far as frightening horses is concerned, possibly because it deposits its eggs in the hairs of the legs.

The throat botfly or chin fly, *Gastrophilus nasalis*, is also widely distributed in the United States and is especially common in the Rocky Mountain region. The adult fly deposits its eggs principally under the jaw of the horse, often causing an animal to throw its head violently and sometimes to strike with its fore feet. The parasitic larvae of this species are usually yellowish and very much paler than the common bots mentioned above. They are found mainly attached to the pyloric end of the stomach or in the upper duodenum.

The nose fly, *Gastrophilus haemorrhoidalis*, has at the present time a limited distribution, being confined mostly to the North Central and certain of the Rocky Mountain States, but it appears to be spreading in all directions. The adult of this species deposits its eggs on the hairs on the edge of the lips and causes many runaways and much annoyance to horses, partly, perhaps, because of its egg-laying habit. This is the most dangerous of all the adult botflies and its spread over the country can be traced in the widening area in which fly-nets and other devices for protecting horses have come into use. The larvae of this species occur most commonly in the pyloric portion of the stomach and may also be found in the anterior portion of the duodenum.

The maggots of the common bot and of the nose bot are taken into the mouth but it has not as yet been shown whether they are swallowed or whether they get into the stomach in some other way. In the case of the throat bot, it has not as yet been definitely ascertained how the maggots get into the host animal. Once in the stomach, however, the maggots attach themselves to the mucosa and remain in that location for a period of from eight to twelve months or longer. The maggots of the common botfly and of the throat botfly remain attached to the wall of the stomach until they are ready to pass out of the body. Those of the nose botfly, after a period of development, let go their hold upon the wall of the stomach and the upper part of the small intestine and pass into the rectum where they reattach themselves, then they detach again and attach themselves, this time to the anus, and remain in this position for three or four days; and finally drop to the ground. This species may pass out at any time and is not normally expelled with the manure, whereas the other two species are expelled with the manure. Usually all fully developed bots have passed out of the stomach by October 1, those remaining during the winter being young forms.

There can be no question as to the injuriousness of bots. It is not uncommon to find several hundred bots in the stomach of a horse and as many as over one thousand bots have been recovered from the stomach of a colt. Bots are attached to the mucosa by means of large mouth-hooks and they bear spines on much of the body surface. The attachment of even a few bots must do some harm to the gastric mucosa, since the attachment produces small areas of inflammation. When many bots attach themselves at the same time a considerable degree of irritation results. The Germans reported a number of horses killed by bots as a result of gross infestations during the fighting along the Russian front in the late war. The attachment of the nose bots to the wall of the rectum and to the edge of the anus before they pass out is very annoying to horses and these animals have been known to dislocate bones in the tail in their attempts to obtain relief by rubbing the affected parts.

Control measures: The most important control measures which have been recommended for botflies include the use of repellents to protect horses from the adult flies, the use of protective mechanical devices to prevent the flies from depositing their eggs on horses, the destruction of the eggs on the horse, and medicinal treatment for the removal of bots from the stomach.

As far as concerns the use of fly repellents, Bishopp and Dove² report that a mixture of equal parts of pine tar and lard applied to the skin of the horse will keep botflies from laying their eggs on the treated parts for about four days after the application of this mixture. These writers also report that they obtained good results by applying to the hair a mixture consisting of pine tar, $3\frac{3}{4}$ ounces; kerosene, $1\frac{1}{4}$ ounces; powdered resin, 1 ounce; laundry soap, 1 ounce; and hot water, to make 14 ounces. The pine tar is thinned with the kerosene and the soap and resin are dissolved in hot water, the two mixtures being poured together. It is recommended that this mixture be applied with a brush. It should be remembered in this connection that repellents are at best merely palliatives, since the flies will deposit their eggs on untreated animals or on parts of treated animals to which the repellents have not been applied.

Various mechanical devices which cover the throat and lips, as well as other parts of the body, have been proposed and used, and these devices have their advantages in that they afford a certain degree of protection against flies and eliminate to some extent the maggots as internal parasites. They are, however, subject to the same limitations as repellents and are merely to be regarded as palliative measures.

Bishopp and Dove² report that a 2 per cent solution of any of the standard, coal-tar creosote dips applied with a rag to the hair will kill a high percentage of the eggs. According to these workers, a wash of 2 per cent carbolic acid applied to the surface and not rubbed in has also given good results in killing the eggs. In the case of the common botfly seven days elapse between the time that the eggs are deposited until they hatch, so that treatment for the destruction of the eggs must be carried out every six days throughout the egg-laying season.

Medicinal treatment for the removal of bots from the stomach: The animals should be fasted for 18 hours. For a horse weighing 1000 pounds, 6 fluid drams (25 cc) of carbon bisulphid should be administered by stomach-tube or in capsule. No purgatives should be used in connection with this treatment. Following the administration of carbon bisulphid the bots may continue to pass out for seventeen days. This treatment is approximately one hundred per cent effective. If there is any question as to the animal's ability to tolerate the dose given above, two doses of 4 drams each, with a two-hour interval between the doses, or three doses of 3 drams each, with an hour interval between the

doses, may be given. The single-dose treatment is the most effective and should be used in preference to the divided treatments when there are no contraindications. Yearling horses should be given half of the above doses. Food and water should be withheld for about three hours following the treatment.

Carbon tetrachlorid in doses of 6 to 12 fluid drams (25 to 50 cc) will remove approximately 25 per cent of the bots.

STOMACH WORMS

Horses commonly harbor four species of stomach worms, of which three species are spirurids belonging to the genus *Habronema*. These nematodes have a more or less complex life history involving insects as intermediate hosts, whereas the remaining species of nematodes inhabiting the stomach of the horse is a trichostrongyle, having a direct life cycle with several free-living stages which are passed in the manure and on the pasture.

The life cycles of the three species of *Habronema* are essentially similar. The eggs develop within the female worm to a point where active embryos are produced, the embryo being enclosed in a flexible thin shell. The embryos pass out with the manure and are taken up by the secondary host which is a species of fly. In the case of two species of stomach worm, *H. muscae* and *H. megastoma*, the embryos enter the maggots of the ordinary house fly, *Musca domestica*, and related species of the genus *Musca* as they feed in manure. In the case of the other species, *H. microstoma*, the stable fly as well as the housefly is the intermediate host, the former being as a rule the preferred intermediate host. The young worms pass through three larval stages in flies, reaching the last stage of development shortly before or after the maggots become adult flies. At this stage the larvae are found in the head, frequently in the proboscis, but they also occur in the thorax and in the abdomen. When infected flies, either while still alive or not too long dead, are swallowed by horses or other equines, the larvae get into the stomach, where they develop to the adult stage. Another and perhaps more common method of infection is as follows: As flies feed on the moisture of the lips of horses the larvae which occur in the proboscis of the insects escape and are swallowed, the warmth and moisture of the lips stimulating the larvae to escape from the flies.

While *H. musca* and *H. microstoma* are of comparatively little importance as far as concerns their injury to the gastric mucosa,

though both of these species push their heads deeply into the mucosa, *H. megastoma* produces large tumors in the stomach, these tumors attaining the size of a hen's egg. The tumors occur between the mucosa and the muscular layers of the glandular portion of the stomach and are firm in texture, becoming hard and fibrous in the course of time. The tumors frequently contain pus and dead worms and probably also interfere with the function of the gastric mucosa. When the tumors are located near the pylorus they may interfere mechanically with the passage of food into the duodenum. These conditions, together with the absorption of pus, of dead and degenerated worms, and of necrotic material produce a clinical condition of malnutrition and digestive disturbance.

SUMMER SORES AND OTHER PATHOLOGICAL CONDITIONS ASSOCIATED WITH THE LARVAE OF HABRONEMA

A condition in horses reported from various parts of the world as a granular dermatitis, summer sores, habronemic granulomata, or cutaneous habronemiasis, is, according to the observations of various competent investigators, due to *Habronema* larvae, probably to the larvae of all three species, although the larvae of only two species, *H. muscae* and *H. megastoma*, have been definitely incriminated as causal agents of this skin disease. Summer sores due to *Habronema* larvae have been reported from the Belgian Congo, Brazil, France, Australia and other parts of the world. According to certain investigators, the larvae do not develop sores on the intact skin but can maintain themselves only in abrasions of the skin, on sites of operations, injury and irritation.

Summer sores in horses are characterized by the formation of ulcers containing caseous or calcareous granulations from the size of a grain of millet to that of a nut. The sores tend to disappear in winter, the prevalence of the disease being in a general way parallel with the prevalence of flies.

Habronema larvae have also been found in the eye in association with conjunctivitis for which they are believed to be responsible. They have also been reported from the lungs, occurring in this organ in grayish nodules of irregular shape, usually small, but sometimes as large as a nut or even larger.

There is no known medicinal treatment for these parasites at the present time, although carbon bisulphid and carbon tetrachlorid are probably promising drugs for the removal of these

worms. Prevention consists in the proper disposal of manure to prevent flies from breeding, and involves especially cleanliness of stables and yards.

The remaining species of nematodes occurring in the stomach of horses is a small slender thread-like worm, *Trichostrongylus axei*, which occurs embedded in tumors in the glandular portion of the gastric mucosa. So far as can be judged from its systematic position, this nematode has a simple and direct life history. Presumably it is as follows: The eggs which are eliminated with the feces hatch on the pasture and the larvae undergo two molts, emerging as infective larvae after the second molt; the infective larvae on the pasture are swallowed by the horse in feeding and on getting into the stomach the young worms settle down in this organ and develop to maturity.

The lesions produced by *T. axei* vary somewhat in appearance. Those occurring in the cardiac glandular region are more or less uniformly flattened elevations ranging in size from a few millimeters to about 5 cm. in diameter, are light in color and are covered with a thick layer of mucus. The lesions occurring in the fundus gland region are raised, umbilicated adenoma-like growths and are about 1 cm. in diameter. The mucous membrane may also show an irregular roughened appearance; sometimes small wart-like elevations or papillomata may be observed. In all cases in which lesions due to *T. axei* are present, the mucous membrane is covered by a thick layer of tenacious mucus.

There is no adequate information regarding treatment for the removal of this parasite. Carbon bisulphid, carbon tetrachlorid, tetrachlorethylene and oil of chenopodium are worthy of trial and would probably kill worms not so embedded in mucus or the mucosa as to be out of reach.

The prophylactic measures against these worms are the same as those recommended in connection with strongyles of the large intestine and these measures will be discussed in connection with the latter worms.

THE LARGE INTESTINAL ROUNDWORM OF HORSES

The large intestinal roundworm of horses, *Ascaris equorum*, is a dangerous parasite, especially when it occurs in large numbers, a condition which is by no means uncommon in colts. Reports of hundreds and even of several thousand worms in a single animal are on record. Deaths among horses have been attributed to these roundworms as a result of mechanical occlusion

of the intestine by a mass of worms, perforation of the intestinal wall with resultant peritonitis, rupture of the wall of the duodenum by a tightly packed mass of worms, severe gastro-enteritis due to gross infestation, and other mechanical and possibly chemical causes, the latter involving the absorption of toxic worm products by the host.

As far as has been determined, the life history of *A. equorum* is essentially similar to that of the swine ascarid, *A. suum*. The eggs produced by the female worm pass out with the manure and develop on the pasture and in insanitary stables to the point where each viable egg contains an infective embryo. When such infective eggs are swallowed by horses or other equines, the embryo escapes from the egg-shell in the alimentary canal of the host. The liberated larvae make their way to the liver via the blood-stream, and thence to the lungs. In the course of these migrations the larvae produce pathological changes in these organs. The young worms probably get back to the small intestine by crawling up the trachea and down the esophagus, or they may be coughed up and swallowed. On getting back to the small intestine, they settle down and develop to fertile maturity.

In considering the pathogenicity of horse ascarids it is important to bear in mind that the larvae may produce serious injury to horses, especially to foals, as a result of their migrations through the lungs, and if many larvae go through this organ at the same time a serious, if not a fatal, pneumonia may develop. In a study of experimental ascariasis in colts, *Hadwen*³ has actually demonstrated symptoms of pulmonary disturbance as evidenced by rapid breathing, rise in temperature and a cough. Postmortem examination of the experiment colts revealed the lesions of pulmonary ascariasis and showed the presence of the larvae in the lungs.

The lesions produced by ascarids in the intestine of the horse are those of a mild catarrhal condition or low-grade inflammation of the mucosa. There is also a strong probability that these worms elaborate toxic products which are absorbed by the host and produce a clinical picture of intoxication. The presence of toxic products in various chemical fractions of *Ascaris* has been definitely demonstrated.

Treatment: There are two dependable drugs for the removal of the equine ascarids, namely, carbon bisulphid and carbon tetrachlorid, and the same procedures recommended in connection

with the use of these drugs for the removal of bots apply equally to their use for the removal of ascarids. The efficacy of these drugs for horse ascarids is approximately 100 per cent.

Prevention: Prevention of ascariasis in horses should follow the same general procedures which have given uniformly successful results in preventing roundworm infestation in swine. The following plan which is based on the system of swine sanitation developed by the U. S. Bureau of Animal Industry in McLean County, Illinois, with modifications to meet the general scheme of horse husbandry, is suggested as a theoretically sound working basis. The feces of pregnant mares should be examined microscopically for roundworm eggs and if eggs are found to be present, infested mares should be treated with carbon bisulphid or carbon tetrachlorid, preferably in the earlier stages of pregnancy. In so far as possible, precautions should be taken to prevent reinfestation by pasturing such mares on clean pastures and stabling them in clean stalls. Shortly before foaling, the foaling barn, which should be of sanitary construction, should be thoroughly cleaned and all litter should be removed. It should then be thoroughly washed with hot water and lye.

The mare and foal should be pastured in a clean paddock for at least two weeks and kept in a clean stall which has been thoroughly cleaned and washed with hot water and lye. This preliminary period of special care is designed to protect the foal from picking up the eggs of the roundworm at a period of life when it is perhaps more susceptible to the effects of parasites and has less resistance to them than subsequently. The mare and foal should then be moved to clean pasture, that is a pasture which has not previously been occupied by infested horses, and should be stabled in a barn adjoining the pasture. The stall should be frequently and thoroughly cleaned and the manure removed every day. If the colts can be carried through the first year without being exposed to roundworm infestation there are possible chances of their developing an age resistance, at least a relative resistance, to those worms, although this point requires experimental proof. At any rate, by observing the precautions outlined in this paper colts will be protected to a great extent against roundworms and to a lesser extent against other parasites during a period when they can least withstand the effects of parasitism.

STRONGYLE PARASITES OF THE COLON AND CECUM OF HORSES

Horses and other species of equines harbor numerous species of strongyles in the cecum and colon. Up to 1902, only two or three species were commonly reported in text-books and these were assigned to a single genus (*Sclerostoma* or *Strongylus*). In 1901, Looss,⁴ working in Egypt, described and figured 19 distinct species of strongyles, representing 4 genera, from horses and donkeys. By 1918 the number of genera as reported by Ransom and Hadwen⁵ had increased to 5 and the number of species to 27. Theiler,⁶ in 1923, lists 8 genera and over 50 species of strongyles from the colon and cecum of equines. Cram,⁷ in 1924, recognizes 14 distinct genera and 59 species and varieties of strongyles from these animals and since 1924 new forms have been added to the list.

The forms of strongyles best known to veterinarians are the so-called red worms, blood worms or palisade worms, belonging to the genus *Strongylus*, of which three species are of common occurrence in equines. The largest species of this genus is known as *Strongylus equinus* and has three teeth at the base of the mouth capsule; the smallest form is *S. vulgaris* which has but a single tooth at the base of the mouth capsule, while a form more or less intermediate in size between these two species is *S. edentatus* which lacks teeth at the base of the mouth capsule.

The life histories of the three species of *Strongylus* are in the main very similar, as far as they are known. The eggs produced by the female worms pass out in the manure and develop on the pasture. The embryo hatches after a period of development which is largely contingent on temperature and moisture conditions, high temperatures accelerating and low temperatures retarding the rate of development of the egg, and moisture being indispensable to development. Desiccation has been shown to be fatal to the eggs. After undergoing two molts, the free-living larvae reach the infective stage. Apparently these larvae are taken into the alimentary canal of the horse by way of the mouth, and develop ultimately to fertile maturity, apparently after more or less wandering, as a rule, through the body tissues. The details of the life history of the various species of *Strongylus* have not been worked out and it is not definitely known to what extent the larvae which are found in various locations outside of the alimentary canal represent forms which have strayed accidentally from their normal course and to what extent these

migrations are customary phases of the normal life cycle. Since the wanderings are so general, presumably some wandering, at least, is normal.

Immature forms of *S. equinus* have been encountered in various locations outside the alimentary canal, namely the pancreas, liver, kidneys, hepatogastric ligament, mesentery, lungs, and other locations. Agamic forms of *S. edentatus* occur under the peritoneum, especially on the right side, in the pleura, the peritoneal cavity, testes, the spermatic cord, hepatic ligaments, peri-renal connective tissue, muscles of the fore leg, and according to certain observations they also occur in the liver, spleen and pancreatic connective tissue. Immature forms of *S. vulgaris* occur in aneurisms in the anterior mesenteric artery, in the mesenteric lymph-glands, in submucous nodules of the walls of the large intestine and occasionally in hepatic, renal, spermatic and other arteries. Immature forms of this species also have been found in the right heart and in nodules in the liver and lungs.

The three species of *Strongylus* not only produce injury to the host by direct abstraction of blood, but they also injure the epithelium at the points of their attachment to the mucosa, thus exposing the injured mucosa to bacterial invasion. The major pathological significance of *Strongylus* infestation in horses relates to the occurrence of immature forms of *S. vulgaris* in arterial blood-vessels, especially in aneurisms in the anterior mesenteric artery. Over one hundred worms have been removed from a single aneurism. The portion of the artery in which these worms produce lesions dilates and develops into an aneurism which may attain the size of a child's head.

The other species of strongyles which occur in the colon and cecum of equines are more or less closely related to *Strongylus* and from this it may be inferred that they have life histories essentially similar to that of the genus *Strongylus*, as far as concerns the free-living stages of the worms in manure and on the pasture, and probably also as regards the mode of entry into the host. One species, *Triodontophorus tenuicollis*, deserves special consideration because it produces ulcerations of the mucosa of the colon. The worm is supplied with blade-like teeth, which probably play an important part in the production of the ulcers.

Aside from the pathological conditions resulting from the wandering habits of the larval forms of the species of *Strongylus*, these worms and the other related species which occur in the large intestine of equines produce a general picture commonly referred

to as strongylidosis, which is characterized by weakness, anemia, emaciation, poor appetite, rough coat, sunken eyes and various digestive disturbances commonly associated with intestinal parasitism.

Treatment: The horses to be treated should be fasted for 36 hours and then treated either with oil of chenopodium or carbon tetrachlorid, the doses given below being for animals weighing approximately 1000 pounds.

Four to five fluid drams (16 to 20 cc) oil of chenopodium by stomach-tube or in capsule, immediately preceded or followed by one quart of raw linseed oil for choice, or by an aloes ball. Following this treatment, which has an efficacy of nearly one hundred per cent, blood strongyles and other strongyles may continue to pass for six days or more.

Carbon tetrachlorid in doses of 6 to 12 fluid drams (25 to 50 cc) is as effective as oil of chenopodium for blood strongyles, but only about 50 per cent effective against small strongyles as far as it has been carefully tested. In the cases of pregnant mares, carbon tetrachlorid is preferable to oil of chenopodium, the latter drug being dangerous to pregnant animals.

Prevention: In addition to treatment, one indicated preventive measure against strongyle infestation is pasture rotation. In the absence of information concerning the period required for the development of the worms to fertile maturity in the body of equines, no definite scheme of pasture rotation can be formulated. Systematic treatment with anthelmintics will cut down the supply of eggs that are deposited on pastures with manure. Frequent removal of manure and bedding from stables will diminish the chances of infestation from that source, and the disposal of manure in such a manner as to prevent it from contaminating the pasture is another essential prophylactic measure.

There still remains to be considered the infestation resulting from the manure which is deposited by horses on pastures and which constitutes the greatest source of danger, since each deposit is a focus of infection and of pasture pollution with the infective larvae. Aside from the actual removal of the manure, which should be undertaken if possible and if the expense involved is warranted, the natural drying of manure on pastures, which is destructive to eggs and larvae, may be aided by breaking up the manure in order to hasten the process of desiccation. The surface of manure deposits becomes sufficiently dry in a few days to destroy the eggs and pre-infective larvae contained in

them, but the interior of the deposits retains sufficient moisture to enable the free-living stages of strongyles to maintain their vitality for a long time, even for a period of several months. The mechanical breaking up of such deposits and the spreading of them in as thin a layer as possible, will tend to promote desiccation and cut down the supply of viable eggs and larvae.

PINWORMS

Pinworms, *Oxyuris equi*, occur in the colon, cecum and rectum of equines, and aberrant specimens occasionally enter the vagina from the anal region. As a rule eggs of pinworms are not eliminated as such from the host, but the gravid females pass out in the manure and oviposit outside of the host, or the gravid females migrate through the anus and deposit eggs in crusts on the margin of the anus. As far as is known, infestation results from swallowing the infective eggs that have undergone a preliminary period of development to the point where each egg contains an embryo.

Pinworms in horses produce an anal pruritis, the itching being attributed to the passage of the female worms to the perineal region or to the crushing of these worms during their passage through the anus. The itching causes the affected animal to rub the tail and buttocks against any convenient object, a common result being the rubbing off of the hair at the root of the tail. In exceptional cases the perineal region may become excoriated as a result of persistent rubbing. There is also a considerable amount of evidence indicating that the worms in the large intestine are not altogether harmless, and that they may produce symptoms of anemia and digestive disturbances.

Treatment: Oil of chenopodium, as recommended in connection with treatment for the removal of strongyles, is equally effective for the removal of pinworms. Two fluid drams of oil of turpentine may be substituted for oil of chenopodium, and this drug should also be immediately preceded or followed by linseed oil or an aloes ball.

TAPEWORMS IN HORSES

Horses in the United States are occasionally infested with tapeworms belonging to the genus *Anoplocephala*, of which three species occur in the horse. The life histories of these tapeworms as well as those of related species which occur in ruminants and in other herbivorous animals, have not yet been ascertained, and in the absence of this information control measures can not be formulated.

Of the three species of horse tapeworms known to occur in the United States, *A. magna*, which occurs in the duodenum and upper jejunum, appears to be the most common, *A. mamillana* from the jejunum and ileum being less common, and *A. perfoliata*, which commonly occurs in the ileum and cecum, being comparatively rare.

Tapeworms in horses may give rise to digestive disturbances, especially when the infestation is heavy. In exceptional cases severe emaciation and anemia have been attributed to these parasites. *A. perfoliata*, which appears to be the least common form in American horses, is generally regarded as the most injurious of the horse tapeworms because it is so firmly attached to the mucosa that the heads of the worms produce, by mechanical action, small ulcerative depressions with elevated margins.

Very little is known regarding treatment for horse tapeworms, and as a rule this infestation is rarely diagnosed antemortem. Male fern or kamala may prove effective against these worms but critical tests are necessary to establish the efficiency of these or other drugs for the removal of *Anoplocephala*.

SUMMARY

The essential facts with reference to gastro-intestinal parasitism in horses and other equines as outlined in this paper may be briefly summarized as follows:

1. Three species of bots, *Gastrophilus intestinalis*, *G. nasalis* and *G. haemorrhoidalis*, occur in the stomach, firmly attached to the mucosa, the last mentioned species also attaching itself to the upper part of the duodenum, the rectum and the anus. In addition to the irritation to the lining of the stomach produced by these parasitic maggots, the adult flies, especially those of *G. haemorrhoidalis*, cause considerable annoyance to horses by their egg-laying habits and from some psychological fear of the fly by the horse.

2. Three species of nematodes belonging to the genus *Habronema*, *H. muscae*, *H. microstoma* and *H. megastoma*, and one species of trichostrongyle, *Trichostrongylus axei*, occur in the stomach, all of these forms being more or less pathogenic. *H. megastoma* produces large gastric tumors and *T. axei* produces pathological changes in the gastric mucosa which vary from small wart-like growths to relatively large, raised, umbilicated growths resembling adenomas.

3. A granular dermatitis in horses, known as summer sores, is commonly associated with larvae of *Habronema*, and a form of conjunctivitis due to these larvae has also been observed. Nodules in the lungs may be produced by *Habronema* larvae.

4. The large intestinal roundworm of equines, *Ascaris equorum*, is a potentially dangerous parasite for foals, partly because the larvae of these worms migrate through the lungs and are capable of producing pneumonia, and partly because of the bad effects due to the worms in the intestines. These worms may be controlled by a system of sanitation designed to protect young animals from exposure to the eggs of the roundworms.

5. Three species of blood strongyles, *Strongylus equinus*, *S. edentatus* and *S. vulgaris*, and numerous species of smaller strongyles occur in the large intestine and produce a clinical picture of gross parasitism known as strongylidosis. The larvae of *Strongylus* occur in various locations outside of the alimentary canal, those of *S. vulgaris* occurring in arteries, especially in the anterior mesenteric artery, where they produce aneurisms.

6. Pinworms, *Oxyuris equi*, occur in the large intestine and produce an anal pruritis.

7. Three species of cestodes, *Anoplocephala magna*, *A. mamillana* and *A. perfoliata*, occur in the small and large intestine of horses, but nothing is known at the present time regarding the life history of these parasites and very little about treatment or control in general.

8. There are several dependable drugs for the removal of certain parasites from the alimentary canal. Carbon bisulphid is effective against bots and ascarids; carbon tetrachlorid is effective against ascarids, strongyles and to some extent also against bots; oil of chenopodium is effective against strongyles and pinworms; oil of turpentine is effective against pinworms. These treatments are based on the work of Hall⁶ and his collaborators.

9. In addition to medicinal treatment, gastro-intestinal parasites of equines may be controlled to a certain extent by proper disposal of manure in order to prevent flies from breeding and to diminish the contamination of pastures by cleanliness about the stables and yards, the removal of manure from pastures, if possible, or the breaking up of manure masses to promote the process of drying, and by special precautions with reference to young animals to tide them over the period when they are most susceptible to the effects of parasitism.

REFERENCES

- ¹Gedoelet, L.: Synopsis de Parasitologie de l'Homme et des Animaux Domestiques (Lierre & Bruxelles, 1911).
²Bishopp, F. C., & Dove, W. E.: The horse bots and their control. U. S. Dept. Agr. Farmers' Bul. 1503 (1926).
³Hadwen, S.: Ascariasis in horses. Jour. Parasitol., xii (1925), 1, pp. 1-10.
⁴Looss, A.: The *Sclerostomidae* of horses and donkeys in Egypt. Rec. Egypt Govt. Sch. Med., Cairo, 1901, pp. 25-139.
⁵Ransom, B. H., & Hadwen, S.: Horse strongyles in Canada. Jour. A. V. M. A., liii (1918), n. s. 6 (2), pp. 202-214.
⁶Theiler, G.: The strongylids and other nematodes parasitic in the intestinal tract of South African equines. Thèse (Neuchâtel, 1923), Pretoria.
⁷Cram, E. B.: A new nematode, *Cylindropharynx ornata*, from the zebra, with keys to related nematode parasites of the *Equidae*. Jour. Agr. Res., xxviii (1924), 7, pp. 661-672.
⁸Hall, M. C.: Diagnosis and Treatment of Internal Parasites (2nd rev. ed.; Chicago, 1923).

JOIN THE WOMEN'S AUXILIARY

The memory of the splendid meeting we enjoyed so much this summer, in Minneapolis, and the great interest shown in the work of the Women's Auxiliary to the A. V. M. A. is very gratifying and creates a desire to enlarge our activities. This may be done by an increased membership. Thirty-seven new names were added to our membership list at this meeting, and, I am sure, ladies, if you knew more about the work we are doing, you would hasten to join.

You may know about our Student Loan Fund (made possible by our dues of one dollar a year); but, do you know that, since 1922, we have made loans of \$3075 to worthy young men, who, perhaps, would have been unable to continue their college work but for our assistance? These eleven seniors in accredited veterinary colleges have been able to graduate and to enter the veterinary profession with a standing in the professional and scientific world which the older members of the profession have not enjoyed.

An invitation is extended to every woman who is the wife, mother, daughter or sister of a member of the A. V. M. A. to join. It means a great deal to be a part of a worth-while enterprise. Someone has said, "It is the *growing* thing that receives attention." Let us make the Women's Auxiliary *such* a growing thing that its activities will be followed from year to year. Just send your name and address (with the first year's dues of one dollar and fifty cents) to the Secretary, Mrs. S. E. Hershey, 1109 Washington St., Charleston, W. Va., and have your name added to our list.

Begin to make plans to come to the Detroit meeting, enjoy the entertainment, and see what we are doing.

MRS. PETER MALCOLM, *President*.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

USE OF KAMALA IN TAPEWORM INFESTATIONS OF SHEEP

By T. O. BRANDENBERG, *Lakota, N. D.*

During the past five years, thousands of sheep have been placed on North Dakota farms. These have come in most part from Montana and South Dakota and are grade Rambouillets. Little trouble has been had with parasites until the last two or three years. Since that time, however, losses due to parasites have increased by leaps and bounds. This has been partly, if not wholly, due to a violation of the laws of sheep-raising. In some instances it was through lack of money for proper fencing and other equipment, in others a lack of knowledge regarding the handling of sheep on the same farm over a period of years.

Of all the bowel parasites, the broad tapeworm—*Moniezia expansa* (*Taenia expansa*) or *Moniezia alba* (*Taenia alba*)—has been the cause of more loss and been apparently the hardest to control. Particularly is this true of flocks located in the Red River Valley, or in the rolling land further west, where pastures contain sloughs or moist flats during most of the year. Here it has been found that the changing of pastures every few weeks will not in itself control tapeworm infestation, although apparently it has been lighter where these precautions have been taken.

Associated with tapeworm infestation, besides the typical diarrheas and loss in condition, is also found more or less affection of the respiratory tract, manifested by discharge from the nose, coughing, pneumonia and pleurisy. Probably one of the underlying causes of heavy losses during the past winter has been the depleting effects of parasites of this kind the previous season.

Veterinarians and shepherds have posted thousands of sheep the past season and with ease have found the cause of their losses when due to the broad tapeworm. They have treated their flocks with the prescribed copper sulphate solution and nicotin and have had a desirable improvement for a few days or weeks, checking the losses among lambs and lessening the diarrhea.

Generally this abatement has been followed by a recurrence of the previous symptoms and deaths among the lambs, sometimes in epizootic proportions.

Extract of male fern, combined with powdered areca nut in oil, has been used by the writer with good results, but the cost of the remedy in large bands, together with the slowness and tediousness of administration, made this remedy impractical. We began our experiments in the late summer of 1927 and have since that time gone through the category of teniacides. We have finally settled on powdered kamala and copper sulphate as the most efficient for the removal of all bowel parasites of sheep. It is a veterinarian's weapon against tapeworm and not safe in the hands of laymen.

Hartmann recommends kamala very highly for tapeworm and liver fluke and had no bad results when given in proper dosage. Other writers warn us of the persistent diarrhea following its use in lambs. Death followed its use in lambs with one-sided pneumonia or pleurisy, or otherwise seriously weakened. Anyone who has held careful autopsies on lambs dying or just dead from tapeworm infestation can readily imagine a diarrhea following the expelling of the worms when he sees the extent of the inflammation in the infested bowel. Kamala being a purgative, it would certainly not in itself allay this inflammation except by removing the cause of the irritation.

Kamala is very efficient but not fool-proof. Veterinarians should learn to use it intelligently in sheep. Our method of treatment has been used on many thousands of sheep, yet considerable experimental work could be done to ascertain just how small the dose of kamala could be and still remove the parasite. Our method of treatment is as follows:

By autopsy determine that the broad tapeworm is the cause of losses in the flock. Take previously prepared capsules (2-dram, hard gelatin) made in the following way: Mix thoroughly with each pound of powdered kamala, three ounces of freshly powdered copper sulphate. Table I shows the dosage.

TABLE I—*Dosage for sheep*

CAPSULE	DOSE	SIZE OR AGE OF SHEEP
No. 1	1½ dram	Adult sheep
No. 2	1 dram	60 to 90 lb. lambs
No. 3	40 grains	40 to 60 lb. lambs
No. 4	30 grains	25 to 40 lb. lambs

Sheep should be starved from 16 to 24 hours, and if previously fed on soft feeds results are better.

In a flock of 600 sheep and lambs, five of the weakest lambs were selected for experimentation. Each weighed from 30 to 40 pounds, all about the same, very weak and scouring badly. All were placed in pen and starved for 24 hours. Results are shown in table II.

TABLE II—*Test on five lambs*

LAMB	WEIGHT (LBS.)	STARVED (HRS.)	DOSE (GRS.)	TIME KILLED (HRS.)	AUTOPSY FINDINGS
1	30	24	30	$\frac{1}{2}$	Capsule entirely dissolved in the rumen and contents were beginning to mix with the ingesta. Mild infestation of stomach worms in abomasum, 18 broad tapeworms in small intestine, no lung worms or other parasites found
2	35	24	30	1	Contents of capsule well mixed in rumen and some found in abomasum, mild infestation of stomach worms, 16 broad tapeworms in small intestine
3	30	24	30	24	No stomach worms, no tapeworms or heads, wall of small intestine covered with dead stomach worms
4	30	24	30	24	Same condition as above
5	30	24	30	24	Same as above, with exception of two live fringed tapeworms found with heads in bile-duct

The autopsy work was carefully done, the intestinal tube being opened from end to end with scissors and a careful examination made for heads or parts of tapeworms.

Our routine method of handling a flock after treatment is to withhold all food for a few hours, then give them a feed of dry hay for fill, then pasture and in 24 hours they are ready and must be placed on an entirely new pasture of high, well-drained land, if possible.

SUMMARY

Kamala combined with copper sulphate, on account of its corrective action, is our most valuable teniacide in large bands of western sheep, on account of its great efficiency, ease of administration when in capsule and its small cost. It should be administered by a veterinarian and he should acquaint himself with the proper dosage and use of this drug.

THE OCCURRENCE OF THE SWINE KIDNEY WORM (STEPHANURUS DENTATUS) IN THE URINARY BLADDER AND URETERS OF THE HOST ANIMAL

By E. M. NIGHBERT, *Associate Veterinarian, Zoological Division*
U. S. Bureau of Animal Industry
Branch Office, Moultrie, Georgia

The kidneys and more especially the perirenal kidney region are the usual sites of infestation for the mature kidney worm. It is in this region that the male and the female mate. Eggs are deposited in the pockets where the worms lie in the tissues and these eggs pass out through fistulous canals to the ureters or the pelvis of the kidney, then into the bladder, and from here they pass to the outside world with the urine.

There has been more or less uncertainty regarding the ultimate fate of the adult worms occurring in their natural location in the kidney region, as males and females are found in pus pockets. In the writer's experience dead worms or fragments of dead worms are seldom found in these pus pockets in the kidney fat. The literature on these worms seems to lack definite information on this subject. Consequently this paper puts on record recent observations which add to the small stock of information.

In the collection of urine from swine for the purpose of examining it for the presence of kidney-worm eggs, the following observations are made: On August 16, 1926, an aged sow in poor physical condition was catheterized and two fluid ounces of urine drawn from the bladder. The urine as observed in a clear-glass laboratory dish showed flocculent material and rather heavy casts. Urine taken from the clearer portion of the sample and examined microscopically showed only a few kidney-worm ova. A sample from the urine showing heavy flocculent material and examined microscopically showed numerous kidney-worm eggs among the casts and adhering to them. In the examination of the heavier casts microscopically, it was noted that they were semi-transparent in appearance and were held together with threads of a slightly dark color. This material apparently consisted of fragments of the integument and reproductive organs of the kidney worm.

On July 31, 1928, in a postmortem examination on a sow, eleven months old, one adult kidney worm was removed directly

from the lumen of the ureter. This pig showed heavy kidney-worm infestation in kidneys, kidney fat and liver.

These findings show that the kidney worm, as well as its eggs, can, and sometimes does, leave its natural location in the kidneys and kidney fat of the host animal and pass out through the urinary tract. Whether this is the usual fate of these worms after they die is still a question requiring further observations.

COTTONSEED-MEAL POISONING?

By N. S. MAYO, North Chicago, Ill.

In cases where cattle have been fed large amounts of cottonseed meal, one of the first symptoms of so-called cottonseed-meal poisoning usually noted by the stockman, was impaired vision, particularly at dusk or later. This condition was often so marked that it was necessary to feed range animals before dusk to avoid alarming them.

Investigations in human medicine have shown that functional hemeralopia or "night-blindness" is due to a shortage of vitamins. Aykroyd has shown that night-blindness in Newfoundland is due to a lack of vitamin A. Is it not possible that the impaired vision of cattle fed on cottonseed meal may be attributed to the same cause and not a toxic substance in the cottonseed meal?

PICTURE OF NOGUCHI AVAILABLE

The Denver Chemical Manufacturing Company, publishers of *The Bloodless Phlebotomist*, report that No. II of Volume VII of their publication will have a total circulation of 1,250,000 copies. This issue has been published in Spanish, French, German, Italian, and Japanese, as well as English. On the cover page appears a reproduction of a crayon drawing of the late Dr. Higeyo Noguchi, the eminent Japanese scientist who gave his life for humanity a few months ago, while studying yellow fever in Africa. If any reader of the JOURNAL would like to have a copy of this picture suitable for framing, it may be obtained free of charge by writing the Denver Chemical Manufacturing Company, 163-167 Varick St., New York, N. Y.

The U. S. Department of Agriculture reports that the average American eats about 5½ pounds of lamb and mutton per year.

ARMY VETERINARY SERVICE

CHANGES RELATIVE TO VETERINARY OFFICERS

Captain John W. Miner, V. C., is relieved from further observation and treatment at Walter Reed General Hospital, Army Medical Center, Washington, D. C., and will comply with orders directing him to report to Fort Leavenworth, Ks., for duty.

Captain Everett C. Conant, V. C., is relieved from duty at Fort Bragg, N. C., on or about October 15, 1928, and directed to report to Fort Hamilton, N. Y., for duty.

Captain James L. Barringer, V. C., is relieved from duty at Reno quartermaster depot, Fort Reno, Okla., on or about October 15, 1928, and directed to report to Fort Bragg, N. C., for duty.

Captain James R. Sperry, V. C., is relieved from duty at Fort Hamilton, N. Y., on or about September 15, 1928, and will report to commanding officer, Reno quartermaster depot, Fort Reno, Okla., for duty.

Captain Edward M. Curley, V. C., is relieved from his present assignment at New York general depot, Brooklyn, N. Y., and will sail from New York City on or about December 28, 1928, for duty in the Hawaiian Department.

First Lieutenant Harry R. Leighton, V. C., is relieved from duty at Fort Sam Houston, Texas, and will sail from San Francisco, Calif., on or about February 6, 1929, and report for duty in the Philippine Department.

Reserve Corps

New Acceptances

Allen, Clifford Lee.....Capt....1595 Forrest Ave., Memphis, Tenn.
Cox, John L.....2nd Lt..R. D. No. 2, Willoughby, Ohio.
Michael, S. T.....2nd Lt..Univ. of Calif., Berkeley, Calif.

Promotions

O'Brien, James H., 254 Lake Avenue, Worcester, Mass., to Captain.
O'Connell, John A., Boston, Mass., to Major.
Walden, Robert S., Lennox, S. D., to 1st Lieutenant.

Separations

Ranck, Edward M.....Lt. Col..Transferred to Auxiliary Reserve.
Myers, Willis A.....Major...Transferred to Auxiliary Reserve.
Krubsack, Grover.....Capt....Appointment terminated.
McKee, Andrew J.....2nd Lt.. " "
Morrow, Charles D.....2nd Lt.. " "
Edgar, Jean Rogers.....2nd Lt.. " "
George, Albert E.....Capt.... " "
Hansen, Frederick.....1st Lt.. " "
Parker, Elmer B.....1st Lt..Failed to accept reappointment.
Reece, Chester L.....2nd Lt.. " " "
Yandell, Donald A.....2nd Lt.. " " "

BUREAU TRANSFERS

Dr. Hugh J. Clary (St. Jos. '20) from South St. Paul, Minn., to Winona, Minn., on meat inspection.

Dr. Wilbur B. Stegner (McK. '18) from Omaha, Nebr., to Lincoln, Nebr., on tuberculosis eradication.

Dr. Albert M. Meade (K. C. V. C. '09) from Lincoln, Nebr., to Omaha, Nebr., on meat inspection.

Dr. Cecil R. Wilhoit (K. C. V. C. '12) from Philadelphia, Pa., to Lincoln, Nebr., on tuberculosis eradication.

COMMUNICATIONS

MUGGINS LAID TO REST

TO THE EDITOR:

On the green lawn in the shade of a sheltering palm in front of the Administration Building of the Union Stock Yards, and directly under my office window, is a spot which I long ago selected for a few restful moments after lunch each day during the summer months. Last Saturday, this particular plot was consecrated to the memory of Muggins, the famous 38-year-old cow-pony whose death occurred the day before.

This neck-reined wonder who never had a bit in his mouth, who attended more rodeos, and who "cut" more cattle than any other horse in the history of the western frontier, was laid tenderly to rest in the parkway, and the picturesque and impressive funeral services were attended by many people, including cowboys and cowgirls on their steeds. Floral offerings were prominent, cameras were in action and eulogy was read. This beautiful tribute was alike unusual and touching. There were tears unhesitatingly wiped from the eyes of a few, as with bowed heads a number of the old guard of the Wild West solemnly listened to the recounting of the feats of this remarkable equine who was endowed with almost human intelligence. A boy scout sounded taps. And one of these days a monument will mark the grave where Muggins lies under a pasture far richer than any range he had known in his long, wild, useful life.

Los Angeles, Calif., September 18, 1928. R. H. McMULLEN.

STATEMENTS ON TUBERCULOSIS QUESTIONED

TO THE EDITOR:

I have just read the address by Dr. C. H. Mayo, published in the JOURNAL of the American Veterinary Medical Association for September, 1928, page 563, on "The Danger to Man of Bovine and Avian Tuberculosis." It shows a very incomplete knowledge of the history of the controversy over the infection of human beings by the bovine variety of tubercle bacillus. On one point only of this do I comment.

On page 564, second paragraph, the statement as given would lead one to suppose that the question had not been studied until

Koch's address in 1901, and that his address was the reason for investigations carried out by others, some of which are mentioned. As an actual fact, the State Live Stock Sanitary Board of Pennsylvania, of which Dr. Leonard Pearson was Secretary and the writer Bacteriologist, had been studying this matter since 1897 and, at the same Congress at which Koch expressed his erroneous ideas, a paper was read by the writer, which gave a review of the work done in Pennsylvania, and submitted evidence to the contrary. At another session of the same Congress, further evidence was brought forth and the position of Koch attacked.

During the same year, these experiments were carried further and the results published in May, 1902. The first paper referred to can be found in the *Lancet* (London), August, 1901, as well as in the reports of the London Congress on Tuberculosis, and there seems to be no reason for ignorance of the facts. Historians, above all others, should be accurate in their statements.

Another point which needs comment is the statement by Dr. Mayo concerning two cases of alleged avian tuberculosis seen at the Mayo Clinic by himself, which he states "was demonstrated surgically and pathologically." These two cases were reported in the *Southern Medical Journal* for January, 1926, page 29. It is to be noted that in neither of these cases were cultures obtained, nor is there any evidence of the inoculation of animals, so that one may very well question the diagnosis of avian tuberculosis. One may also ask how surgery can diagnosticate avian tuberculosis. Examination of the latest editions of a number of standard books on pathology fail to show any diagnostic features of avian tuberculosis in the human. Stengel and Fox (1927), page 360, say: "Despite the similarity of the bacilli of the human and avian types of tubercle bacilli, it does not seem that the latter can produce tuberculosis in man. In the few cases in which avian bacilli have been isolated from human lesions, the simultaneous presence of human bacilli was not satisfactorily excluded." Certainly it was not proven in either case under discussion, though it appears that this might easily have been done by inoculation.

Without denying that the avian bacillus is sometimes transmitted to human beings, the writer desires to protest against the recording of such cases without definite proof.

MAZYCK P. RAVENEL, M. D.

*University of Missouri,
Columbia, Mo., September 22, 1928.*

AMERICAN VETERINARY MEDICAL ASSOCIATION
Proceedings of the Sixty-fifth Annual Meeting, Minneapolis, Minnesota, August 7 to 10, 1928

SECTION OF GENERAL PRACTICE

WEDNESDAY MORNING, August 8, 1928

The first session of the Section on General Practice was called to order at 9:20 o'clock by Dr. J. N. Frost, chairman.

CHAIRMAN FROST: The Section will come to order. The first on the program is the Chairman's address. We have such a full program that the Chairman is not going to take any time to make an address. We probably have more papers than we will be able to get through with as it is.

The next is the Secretary's report. Have you any report?

SECRETARY ALTHOUSE: No report.

The following program was then presented:

"Field Practice Methods of Immunizing Pigs Against Hog Cholera in the Corn Belt," Dr. Henry Hell.

"A Study in the Simultaneous and Serum-Alone Methods in the Treatment of Cholera-Infected Hogs," Dr. C. N. McBryde.

"Vulvovaginitis in Swine," Dr. S. H. McNutt.

"Some Common Diseases of Sheep," Dr. W. L. Boyd.

"Prevention and Control of Sheep Parasites in Pennsylvania Flocks," Drs. Henry W. Turner and Joseph G. Moon. (Read by Dr. Turner.)

"Diseases of Range Sheep," Dr. E. T. Baker. (Read by Dr. W. L. Boyd.)

"Glucose Therapy," Mr. J. H. Weiner.

The session adjourned at 12:00 noon.

ADJOURNMENT

THURSDAY MORNING, August 9, 1928

The second session was called to order at 9:15 o'clock by Chairman Frost.

The following program was presented:

"Foreign Bodies in Bovines," Dr. E. E. Wegner.

"Returning the Uterus," Dr. E. E. Bittles.

"The Breeding Efficiency of a Herd of Cows Negative to the Agglutination Test for Abortion," Dr. Herbert Lothe.

"The Rejuvenation of Bulls," Dr. T. A. Sigler.

"Poultry Problems in a General Practice, with Special Reference to Coccidiosis," Dr. John Patterson.

"Breeding Diseases of the Horse," Dr. W. W. Dimock.

"Investigations on Anaplasmosis in Cattle," Dr. George W. Stiles.

"The Practical Handling of Anthrax Outbreaks in Badly Infected Territory," Dr. O. M. Norton.

"Bang Bacillus Disease in Bulls," Dr. C. W. Springer. (Read by title.)

"Clinical Manifestations and Surgical Treatment of Lead Poisoning in the Horse," Dr. P. G. MacKintosh. (Read by title.)

CHAIRMAN FROST: Next we come to the election of section officers. The first will be nominations for chairman.

. . . Dr. Wm. M. Bell, of Nashville, Tennessee, was nominated. . . .

. . . There being no further nominations a motion was regularly made, seconded and carried that the Secretary be instructed to cast the unanimous ballot of the Section for Dr. Bell as chairman for the ensuing year. . . .

SECRETARY ALTHOUSE: The ballot for the election of Dr. Bell as chairman of this Section is cast.

CHAIRMAN FROST: Next in order will be nominations for secretary.

. . . Dr. E. P. Althouse, of Sunbury, Pa., was nominated by Dr. H. W. Turner. The nomination was seconded by Dr. T. H. Ferguson. There being no further nominations a motion was regularly made, seconded and carried that the Chairman be instructed to cast the unanimous ballot of the Section for Dr. Althouse as secretary for the ensuing year. . . .

CHAIRMAN FROST: I hereby cast the unanimous ballot of the Section for Dr. Althouse as secretary for the ensuing year.

A motion is in order to adjourn.

DR. W. L. BOYD: I move we adjourn.

. . . The motion was seconded and carried. The meeting adjourned at 12:50 p. m. . . .

ADJOURNMENT

SECTION ON SANITARY SCIENCE AND FOOD HYGIENE

WEDNESDAY MORNING, August 8, 1928

The first session was called to order at 9:00 o'clock by Dr. R. V. Rafnel, chairman.

CHAIRMAN RAFNEL: The first number on our program is an address by the Chairman. I think they just put this in to fill up the program as I have no address to make. Dr. Lytle has no Secretary's report so we will proceed with the papers.

The following program was presented:

"The Practical Relation of Autopsy Findings to Field Work in Tuberculosis Control," Dr. J. A. Barger.

"Sensitivity, Infectivity and Intertransmissibility of Tuberculosis," Dr. A. F. Schalk.

"The Present Status of Infectious Abortion Control from a Laboratory Standpoint," Dr. Ward Giltner.

"Johnin versus Avian Tuberculin as a Diagnostic Agent for Paratuberculosis of Cattle," Dr. W. A. Hagan.

"Results from the Use of Huddleson's Vaccine for Bang's Disease," Drs. Ward Giltner, I. F. Huddleson, L. T. Clark and A. S. Schlingman. (Read by Dr. Schlingman.)

. . . The session adjourned at 12:30 p. m. . . .

ADJOURNMENT

THURSDAY MORNING, August 9, 1928

The second session was called to order at 9:00 o'clock by Dr. R. V. Rafnel, chairman.

The following program was presented:

"Regulatory Work with Bacillary White Diarrhea," Dr. B. T. Simms.

"Some Obscure Diseases of Sheep," Dr. Hadleigh Marsh.

"Rabies Control in Indiana," Dr. F. H. Brown.

"Rabies Control in Michigan," Dr. B. J. Killham.

CHAIRMAN RAFNEL: The next order of business is the election of officers of the Section for the ensuing year.

DR. ADOLPH EICHHORN: Mr. Chairman, I take great pleasure in nominating Major Kelser for chairman.

DR. H. K. WRIGHT: I second the nomination.

. . . It was duly moved, seconded and carried that Major Kelser be elected chairman of the Section by acclamation. . . .

CHAIRMAN RAFNEL: Nominations for secretary are now in order. Whom will you have for secretary?

Dr. F. H. Brown, of Indianapolis, Ind., was nominated and his nomination was duly seconded. A motion prevailed that the nominations be closed. Dr. Brown was then elected secretary by acclamation.

The session adjourned at 12:00 noon.

ADJOURNMENT

SECTION ON SMALL ANIMAL PRACTICE

WEDNESDAY MORNING, August 8, 1928

The first session of the Section on Small Animal Practice was called to order at 9:00 a. m. by Dr. J. V. Lacroix, chairman.

CHAIRMAN LACROIX: The first thing on the program is the Chairman's address. That operation will be as painless as possible, and will consume very little time. The Chairman has prepared no address. It is perhaps appropriate to say, however, that our section of the A. V. M. A., in its deliberations, has attracted phenomenal attention. The reasons for that will be obvious when I explain that this interest is the comparative newness of the work. It has been estimated that approximately one-half of the hospitals for small animals have been built within the last six or eight years. Half of the hospitals that exist in this country, at that rate, have been built within a decade. Half of all the practitioners in the United States will be hospitalizing some small animals. The very nature of the work we do, particularly when we have facilities for hospitalizing animals, necessitates our doing good work. Or, to put it otherwise, there is little justification for other than the best work in the handling of small animals. I think it should be the duty of this Section of our national organization to encourage better work in diagnoses. I think there is no excuse whatever for practitioners who do very much small-animal practice failing to employ modern methods in the diagnosis of intestinal disorders. Our surgery should be the very best. It is easy to confine our patients; they lend themselves nicely to the use of anesthetics. I think we should rather lead the way in the development of methods for employing anesthesia of some sort. And so it is, I believe, all the way through. We can, in general, pattern after the work done by physicians, and in hospitalizing

our patients we can, within reason, follow the example that has been set in the hospitalization of human patients.

At the same time I believe we should be cautious in our work, lest we go too far in some of this imitation. We should guard against methods that are questionable and presented largely for the effect on the clientele, such as advertising stunts of various kinds in connection with the employment of remedial agents. Particularly, I think, we should not go too far in the use of that which is untried. A fault is rapidly developing wherein, for instance, light is used for its therapeutic effects. This, however, does not justify the employment of an ordinary red lamp in an ordinary socket for a suffering dog, and this claimed to be a valuable treatment for distemper.

We have considerable work to do, and I shall conclude simply by stating that I hope in years to come this Section will lead, or pave the way, in the work of making progress in the application of diagnostic principles, in the application of therapeutic measures, and everything, in fact, that will tend to promote our interests in general.

Thank you!

The report of the Secretary is next in order.

SECRETARY MILKS: I feel that you men are going to be more interested in the program than in the Secretary's report. I feel that way about it myself and I figure you do too.

I would like to say a word about the program in general and that is just a word to you men. You men have got to supply the program and I hope that the next secretary will be able to get some papers from some of you. That is one way in which you can all help. You will all know in plenty of time who the secretary is, so if you have a paper volunteer to give it. One other thing that I want to say is that if you are asked to give a paper and you do not feel that you can give one, please reply to that effect. It is quite surprising what poor correspondents some men are. We write dozens of letters without receiving even a single reply of any kind.

I want to thank the men who are going to contribute to this program for their cooperation and I think I will have to submit the program as the Secretary's report. Thank you!

The following program was presented:

"Ultraviolet Ray in Small-Animal Practice," Dr. J. C. Flynn.

"Hookworm Infestation in Dogs (Uncinariasis)," Dr. S. W. Haigler.

"Anatomy of the Dog," Dr. J. D. Grossman. (Illustrated with lantern-slides.)

While the Section was awaiting the installation of the lantern for the use of Dr. Grossman, Dr. J. V. Lacroix read a report entitled, "A Manual of Small Animal Hospital Standardization." Dr. J. C. Flynn occupied the Chair while Dr. Lacroix read his report. Following its presentation it was duly moved, seconded and carried that the Section on Small Animal Practice approve the recommendation contained in the report and that same be transmitted to the Executive Board for further action.

It was duly moved, seconded and carried that the discussion of Dr. Grossman's paper be taken up at the following session. The session adjourned at 12:30 p. m.

ADJOURNMENT

THURSDAY MORNING, August 9, 1928

The second session was called to order at 9:00 o'clock by Dr. J. V. Lacroix, chairman.

The following program was presented:

"Some of the Rarer and More Neglected Parasites of Dogs and Cats," Dr. E. W. Price.

"The Hospitalization of Small Animals," Dr. J. Elliott Crawford.

At this point it was duly moved, seconded and carried to proceed with the election of section officers.

CHAIRMAN LACROIX: The first will be nominations for the office of chairman.

Dr. C. W. Bower, of Topeka, Kansas, was nominated. There being no further nominations a motion prevailed to have the Secretary cast the unanimous ballot of the Section for Dr. Bower as chairman for the ensuing year.

SECRETARY MILKS: I cast the ballot for Dr. Charles W. Bower, as chairman for the ensuing year.

CHAIRMAN LACROIX: Next will be nominations for the office of secretary.

Dr. H. J. Milks was nominated to succeed himself as secretary. There being no further nominations a motion was duly made, seconded and carried that the Chairman be instructed to cast the unanimous vote of the Section for Dr. Milks as secretary.

CHAIRMAN LACROIX: I hereby cast the unanimous vote of the Section for Dr. Milks to succeed himself as secretary of the Section.

We are now ready to proceed with the program.

. . . The program was continued as follows: . . .

"Observations on Canine Distemper," Dr. F. W. Wood.

"Emergencies Following Automobile Injuries to Small Animals," Dr. H. W. Brown. (Read by title.)

DR. H. M. HAMILTON: I move we adjourn.

. . . The motion was duly seconded. . . .

CHAIRMAN LACROIX: All in favor of the motion say "Aye"; contrary, "No." The "Ayes" have it.

. . . The session adjourned at 12:25 p. m. . . .

ADJOURNMENT

SECTION ON EDUCATION AND RESEARCH

WEDNESDAY MORNING, August 8, 1928

The first session was called to order at 9:25 a. m. by Dr. R. A. Runnells, chairman.

CHAIRMAN RUNNELLS: Secretary Harkins is not able to be with us, he is detained at home on account of the illness of his wife. President Hilty says that it will not be necessary to appoint a secretary *pro tempore*. Dr. Harkins has sent no report, but I am sure that we all appreciate his efforts in getting up this program. Dr. Harkins had eighteen or nineteen papers offered for the program of this Section, but when the Committee on Program met it was found advisable to transfer some of these papers to the other sections.

I have no chairman's address and, as it is getting late, I think we should proceed with the program.

The following program was presented:

"The Only Source of Supply of the Profession," Dr. David S. White.

"The Essentials in Veterinary Education," Dr. George H. Glover.

"The Pathology of Sweet Clover Disease in Cattle," Dr. Lee M. Roderick.

"The Relation of Diet to Disease," Dr. Solon N. Blackberg. (Read by title.)

"The Effects of *Trichostrongylus Axei* in the Stomach of the Horse," Dr. E. W. Price. (Read by title.)

. . . The session adjourned at 12:30 p. m. . . .

ADJOURNMENT

THURSDAY MORNING, August 9, 1928

The second session was called to order at 9:20 a. m. by Dr. R. A. Runnells, chairman.

The following program was presented:

"Hemorrhagic Septicemia, with Report of One Outbreak in Swine," Drs. M. F. Barnes and A. L. Brueckner. (Read by Dr. Barnes.)

"Further Studies on Enteritis in Swine," Drs. Charles Murray, H. E. Biester, S. H. McNutt and Paul Purwin. (Read by Dr. Murray.)

"Some of the Physico-Chemical Properties of the Virus of Hog Cholera," Dr. H. C. H. Kernkamp.

"Fowl Cholera Studies," Dr. F. R. Beaudette. (Read by title.)

"The Antigenic Value of Formolized Botulinum Toxins," Drs. Robert Graham, E. C. McCulloch and E. A. Tunnicliff. (Read by Dr. Graham.)

CHAIRMAN RUNNELLS: The next in order is the election of officers. We must elect a chairman and a secretary.

. . . Dr. H. E. Biester, of Ames, Iowa, and Dr. M. J. Harkins, of Philadelphia, Pa., were placed in nomination for the office of chairman. A ballot was taken and Dr. Biester was declared elected chairman for the ensuing year. . . .

. . . Dr. W. A. Hagan, of Ithaca, N. Y., was nominated for the office of secretary. There being no further nominations, a motion was duly made, seconded and carried that the Chairman cast the unanimous ballot of the Section for Dr. Hagan as secretary for the ensuing year. Chairman Runnells cast the ballot.

CHAIRMAN RUNNELLS: There being no further business we stand adjourned.

. . . The session adjourned at 12:15 p. m. . . .

ADJOURNMENT

ALUMNI MEETINGS AT MINNEAPOLIS

ALABAMA POLYTECHNIC INSTITUTE

Two veterinary alumni of the Alabama Polytechnic Institute, Dr. B. T. Simms ('11), of Corvallis, Ore., and Dr. R. H. Stewart ('22), of Indianola, Miss., and two members of the faculty, Dr. C. A. Cary (Iowa '85) and Dr. I. S. McAdory (McK. '08), constituted the group which got together at the Andrews Hotel, Minneapolis, Tuesday evening, August 7, 1928, for the purpose of reminiscing and telling stories of college days at Auburn, Alabama. Although the attendance at this meeting was small, it lacked nothing in enthusiasm with Dean Cary as the moving spirit.

CORNELL UNIVERSITY

Alumni of the New York State Veterinary College at Cornell University, to the number of thirteen, got together for their annual A. V. M. A. gathering in Room 134, of the New Nicollet Hotel, Minneapolis, Tuesday evening, August 7, 1928. The attendance list follows:

Dr. H. J. Milks ('04), Ithaca, N. Y.
Dr. W. W. Dimock ('05), Lexington, Ky.
Dr. J. N. Frost ('07), Ithaca, N. Y.
Dr. F. W. Wood ('07), Berkeley, Calif.
Dr. L. E. Case ('08), Honolulu, Hawaii
Dr. C. P. Fitch ('11), St. Paul, Minn.
Dr. E. M. Pickens ('11), College Park, Md.
Dr. T. O. Brandenburg ('13), Lakota, N. D.
Dr. Frank Breed ('13), Lincoln, Nebr.
Dr. J. B. Latshaw ('16), Caruthersville, Mo.
Dr. W. A. Billings ('18), St. Paul, Minn.
Dr. E. J. Frick ('18), Manhattan, Kans.
Dr. C. B. Cain ('23), A. & M. College, Miss.

A number of other Cornell alumni were in attendance at the meeting, but were unable to get to the dinner. The usual after-dinner discussion of personal, college and professional subjects followed.

H. J. M.

IOWA STATE COLLEGE

The largest gathering of veterinary alumni of Iowa State College since the Des Moines meeting of the A. V. M. A., in 1924, took place at the New Nicollet Hotel, Tuesday evening, August 7, 1928. Sixteen states were represented and there were 106 alumni in attendance. The large number of graduates of

recent years was a very noticeable feature of the meeting. The following alumni registered at the meeting and, with but a few exceptions, were in attendance at the dinner.

Dr. C. A. Cary ('85), Auburn, Ala.
Dr. G. H. Glover ('85), Fort Collins, Colo.
Dr. W. H. Austin ('91), Gilman, Iowa
Dr. W. B. Lincoln ('93), Nashville, Tenn.
Dr. B. R. Rogers ('99), Chicago, Ill.
Dr. F. E. Parker, ('00), Des Moines, Iowa
Dr. F. R. Ahlers ('01), Lamonte, Iowa
Dr. A. L. Wood ('02), Hampton, Iowa
Dr. Dan Hurst ('02), Sheldon, Iowa
Dr. H. A. McIntire ('02), Maquoketa, Iowa
Dr. W. H. Lytle, ('02), Salem, Oregon
Dr. R. R. Dykstra ('05), Manhattan, Kansas
Dr. K. W. Stouder ('05), Ames, Iowa
Dr. C. H. Stange ('07), Ames, Iowa
Dr. H. E. Breckenbaumer ('08), Sioux City, Iowa
Dr. G. G. Graham ('08), Kansas City, Mo.
Dr. C. E. Hunt ('08), Mount Pleasant, Iowa
Dr. W. C. Smith ('09), Fairfield, Iowa
Dr. H. D. Bergman ('10), Ames, Iowa
Dr. R. Graham ('10), Urbana, Ill.
Dr. B. E. McCulloch ('10), Eagle Grove, Iowa
Dr. A. R. Menary ('10), Cedar Rapids, Iowa
Dr. H. J. Nygren ('10), Waverly, Iowa
Dr. A. W. Sprague ('10), South Omaha, Nebr.
Dr. J. H. Doerr ('11), Melbourne, Iowa
Dr. O. F. Freed ('11), Huxley, Iowa
Dr. A. L. Born ('11), Story City, Iowa.
Dr. R. G. Lovesee ('11), Anoka, Minn.
Dr. L. W. McElyea ('11), Ames, Iowa
Dr. Louis Nelson ('11), Sioux Falls, S. D.
Dr. L. E. Willey ('11), Sioux City, Iowa
Dr. W. R. Laird ('11), Sioux Falls, S. D.
Dr. D. B. Palmer ('11), St. Paul, Minn.
Dr. C. H. Banks ('12), Tipton, Iowa
Dr. B. J. Lattimer ('12), Springfield, Minn.
Dr. Chas. Murray ('12), Ames, Iowa
Dr. G. P. Simmons ('12), Union, Iowa
Dr. John Patterson ('12), Hedrick, Iowa
Dr. C. E. Juhl ('13), Osage, Iowa
Dr. W. E. Macklin ('13), Minneapolis, Minn.
Dr. C. D. Rice, ('13), Ames, Iowa
Dr. C. H. Haggard ('14), Luverne, Minn.
Dr. L. A. White ('14), St. Paul, Minn.
Dr. I. D. Wilson ('14), Blacksburg, Va.
Dr. H. L. McMillan ('15), Estherville, Iowa
Dr. L. D. Potter ('15), Storm Lake, Iowa
Dr. E. L. Fitch ('16), Audubon, Iowa
Dr. L. W. Fox ('16), Algona, Iowa
Dr. T. M. Rossing ('16), Bode, Iowa
Dr. W. A. Aitken ('17), Ames, Iowa
Dr. S. H. McNutt ('17), Ames, Iowa
Dr. C. B. Wilson ('17), Britt, Iowa
Dr. H. C. Fitch ('18), Missouri Valley, Iowa
Dr. H. H. Dukes ('18), Ames, Iowa
Dr. E. A. Hewitt ('18), St. Paul, Minn.
Dr. F. E. Walsh ('18), Ames, Iowa
Dr. H. W. Orr ('18), Stillwater, Okla.
Dr. G. B. Fincham ('18), Sioux City, Iowa

Dr. E. H. Allison ('19), Balstan, Minn.
Dr. J. C. Carey ('19), West Liberty, Iowa
Dr. W. C. Verploeg ('19) Pella, Iowa
Dr. L. M. Hadley ('20), Ruthven, Iowa
Dr. P. V. Neuzil ('20), Blairstown, Iowa
Dr. L. H. Phipps ('20), Winnebago, Minn.
Dr. G. W. Cady ('21), Mason City, Iowa
Dr. H. L. Coffin ('21), Adair, Iowa
Dr. Wm. Dohrer ('21), Ayrshire, Iowa
Dr. Carl Hansen ('21), Faribault, Minn.
Dr. P. L. Stow ('21), Newton, Iowa
Dr. O. G. Wheaton ('21), Naperville, Ill.
Dr. D. A. Eastman ('22), Cedar Rapids, Iowa
Dr. D. L. Halver ('22), Shakopee, Minn.
Dr. George Moses ('22), Amboy, Minn.
Dr. S. Sheahan ('22), Lake Mills, Iowa
Dr. W. M. Moermond ('22), Everly, Iowa
Dr. H. E. Woodward ('22), Wittemore, Iowa
Dr. W. P. Brower ('23), Menno, S. D.
Dr. C. B. McGrath ('23), Onawa, Iowa
Dr. H. C. Smith ('23), Fort Dodge, Iowa
Dr. B. A. Zupp ('23), Waltham, Minn.
Dr. F. A. Bonstetter ('24), Algona, Iowa
Dr. George Blohm ('24), Sioux Falls, S. D.
Dr. A. F. Burger ('24), Alta, Iowa
Dr. L. P. Miller ('24), Buffalo Center, Iowa
Dr. J. R. Scott ('24), Parker, S. D.
Dr. M. A. Emmerson ('25), Ames, Iowa
Dr. H. S. Lames ('25), LaPorte City, Iowa
Dr. A. W. Nyline ('25), Hinckley, Minn.
Dr. R. B. Spearing ('25), Manly, Iowa
Dr. L. E. Stanton ('25), Burt, Iowa
Dr. Ben Anderson ('25), Canton, S. D.
Dr. R. A. Merrill ('26), Clara City, Minn.
Dr. O. Schragg ('26), Freeman, S. D.
Dr. E. J. McCausland ('26), Lake Park, Iowa
Dr. C. A. Hauschen ('26), Brewster, Minn.
Dr. R. H. Arpke ('27), Sheboygan Falls, Wis.
Dr. Glade Chapin ('27), Kasson, Minn.
Dr. D. N. Voetberg ('27), Albia, Iowa
Dr. W. E. Welsh ('27), Hibbing, Minn.
Dr. C. E. Swink ('27), Akron, Ohio
Dr. John Buck ('27), Hills, Minn.
Dr. O. T. Douglas ('27), Galesburg, Ill.
Dr. Louis D. Mersch ('28), Sioux Falls, S. D.
Dr. Russell McNellis ('28), Rouses Point, N. Y.
Dr. John A. Roberts ('28), St. James, Minn.
Dr. Wm. Andrews ('28), Elmore, Minn.

Following the dinner, Dr. H. D. Bergman presided and immediately called upon Dr. W. A. Aitken as yell leader, with very favorable results. Dean C. H. Stange gave an interesting talk on recent progress and developments in the institution as a whole, at Ames, and especially in the Veterinary College, using both moving pictures and lantern-slides. Particularly interesting to the alumni were his description and pictures of the new buildings and laboratories recently completed on the veterinary research farm for carrying on work in the investigation of animal diseases.

Drs. George H. Glover and I. D. Wilson were called upon for brief talks, as was also Dr. J. W. Connaway, of Columbia, Mo., who was the guest of Dr. Robert Graham. Several of the alumni were accompanied by their wives.

Members of the Iowa State College faculty, who are alumni of other institutions, had a busy evening attending the dinners both of their respective alma maters and their adopted institutions. However, all managed to drop in during the evening.

H. D. B.

KANSAS CITY VETERINARY COLLEGE

As per schedule in the program of the Minneapolis meeting of the A. V. M. A., the Kansas City Veterinary College Alumni Association convened around the festive board at the New Nicollet Hotel, Minneapolis, Tuesday evening, August 7, 1928. This was the largest annual gathering of the Association that has been held in recent years. At the banquet table there were fifty alumni and some forty wives, children and sweethearts. Arrangements for the banquet had been made by Drs. W. L. Boyd ('09) and E. W. Berg ('10), of St. Paul. Following the banquet a short business session was held and the following officers were elected for the ensuing year: President, N. F. Williams ('11), Fort Worth, Texas; Vice-President, Dr. J. L. Jones ('13), Blackburn, Mo.; Secretary-Treasurer and Editor of the *K. C. V. C. Alumni Quarterly*, Dr. A. T. Kinsley ('04), Kansas City, Mo.

It was unanimously agreed that the publication of the *Quarterly* be continued, as it was the most authoritative source of information concerning the activities of alumni. A splendid address was given by Dr. G. A. Roberts ('03), of Lavras, Brazil. Dr. Roberts described the home life and modes of living of the native Brazilians. He also briefly indicated the development of agriculture and veterinary medicine in that country. His address was appreciated by all present.

Of those in attendance, fifteen were from Minnesota, seven from the states of Missouri, Iowa and Nebraska, and the rest were from states extending all the way from California, on the west, to North Carolina, on the east. Dr. William M. Bell, of Nashville, Tenn., was the oldest graduate present, having been a member of the class of 1892.

Dr. A. E. Hoffman ('06), of Detroit Lakes, Minn., was the first graduate of the Kansas City Veterinary College to locate in the Gopher State. In all, sixteen different classes were repre-

sented at the meeting. It was unfortunate that the meeting was held during the early part of the convention. If it had been held later in the week, over 100 alumni would have attended the banquet, because that number registered at the convention.

A. T. K.

KANSAS STATE AGRICULTURAL COLLEGE

Veterinary alumni of the Kansas State Agricultural College got together at an informal banquet served in Parlor M, of the New Nicollet Hotel, Minneapolis, Tuesday evening, August 7, 1928. The following were in attendance:

Dr. Fred M. Hayes ('08), Davis, Calif.
 Dr. J. W. Lumb ('10) and wife, Manhattan, Kansas.
 Dr. G. E. Whipple ('11), Omaha, Nebr.
 Dr. Chas. W. Bower ('18) and wife, Topeka, Kansas.
 Dr. F. K. Hansen ('19), Marquette, Mich.
 Dr. M. P. Schlaegel ('20) and wife, Burr Oak, Kansas.
 Dr. J. A. Bogue ('21) and wife, Lawrence, Kansas.
 Dr. Carl A. Brandley ('23), Manhattan, Kansas.
 Dr. F. W. Crawford ('23), S. St. Paul, Minn.
 Dr. E. R. Frank ('24), Manhattan, Kansas.
 Dr. E. R. Moberg ('25), Dawson, Minn.
 Dr. P. R. Carter ('26), Minneapolis, Minn.
 Mr. R. W. Jackson ('30), Minneapolis, Minn.

Drs. George A. Young ('12), of Syracuse, Nebr., and W. A. Hagan ('15), of Ithaca, N. Y., were in attendance at the convention, but were unable to be present at the K. S. A. C. banquet.

After an unusually well-prepared and well-served dinner, brief responses to toasts were made by Mrs. J. W. Lumb, for the ladies; Dr. F. M. Hayes, for the research workers; Dr. G. E. Whipple, for the serum manufacturers; Dr. F. K. Hansen, for state sanitary workers; Dr. M. P. Schlaegel, for the practitioners; Dr. F. W. Crawford, for the U. S. Bureau of Animal Industry; and Dr. P. R. Carter, as the most recent graduate, spoke for work in connection with a state health department.

Taken as a whole the affair was a very enjoyable one and indicated at least two things:

1. The large variety of vocations in which veterinary graduates of the Kansas State Agricultural College are engaged.
2. The loyalty of K. S. A. C. graduates as evidenced by a 100 per cent attendance of those not otherwise engaged.

R. R. D.

MICHIGAN STATE COLLEGE

At the call of Dr. H. K. Wright, of Philadelphia, Pa., the Michigan State College veterinary alumni in attendance at the

Minneapolis meeting of the A. V. M. A. turned out 100 per cent. The address of the meeting place will be furnished on request; also the per cent. The roll-call of alumni, faculty and guests is as follows:

Dr. L. H. Wileden ('13), Mason, Mich.
 Dr. H. K. Wright ('15), Philadelphia, Pa.
 Dr. R. A. Runnels ('16), Blacksburg, Va.
 Dr. H. J. Stafseth ('17), East Lansing, Mich.
 Dr. K. B. Hanson ('19), Saratoga Springs, N. Y.
 Dr. L. J. Heiden ('23), Escanaba, Mich.
 Dr. H. J. Fiege ('25), Kenosha, Wis.
 Dr. I. F. Huddleson ('25), East Lansing, Mich.
 Dr. J. S. Matteson ('25), Parnell, Mo.
 Dr. W. Giltner (Corn. '06), East Lansing, Mich.
 Dr. W. L. Chandler, East Lansing, Mich.
 Mr. W. L. Mallmann, East Lansing, Mich.
 Dr. R. E. Shigley (Chi. '09), Kenmare, N. D.
 Dr. B. J. Killham (McK. '12), Lansing, Mich.
 Dr. H. L. Delez (Colo. '25), St. Paul, Minn.

W. G.

OHIO STATE UNIVERSITY

Under arrangements made by Drs. H. C. H. Kernkamp and R. Fenstermacher, the alumni of the College of Veterinary Medicine, Ohio State University, had a very enjoyable evening in Parlors O-P, of the New Nicollet Hotel, Tuesday evening, August 7, 1928. in the form of a banquet, with Dean David S. White as master of ceremonies. As time was limited, everyone present was not asked to make an address, nevertheless the following were permitted to make a few remarks:

Mrs. H. C. H. Kernkamp (for the ladies), Drs. C. H. Hays, H. M. Newton, R. P. Marsteller, H. E. Pinkerton, S. J. Alcalay, Jas. D. Grossman, C. C. Palmer and H. C. H. Kernkamp. Dr. Reuben Hilty was called upon, but he had to leave the room before the speech-making got under way. The following list shows those who were present at the banquet. Many other alumni were in attendance at the meeting during the week.

Dr. David S. White ('90) and wife, Columbus, Ohio
 Dr. C. C. Lipp ('03) and wife, Brookings, S. D.
 Dr. C. H. Case ('04), wife and son, Akron, Ohio
 Dr. L. W. Goss ('05), Columbus, Ohio.
 Dr. R. P. Marsteller ('05), College Station, Tex.
 Dr. H. M. Newton ('05), Charleston, W. Va.
 Dr. H. E. Pinkerton ('05), Lincoln, Nebr.
 Dr. F. A. Imler ('06), Kansas City, Mo.
 Dr. Reuben Hilty ('07) and wife, Toledo, Ohio.
 Dr. H. H. Fairbank ('08), Columbus, Ohio
 Dr. C. H. Hays ('08), Lincoln, Nebr.
 Dr. G. S. Weaver ('08) and wife, Brookings, S. D.
 Dr. J. O. Wilson ('08), Pierre S. D.
 Dr. Harry Evenson ('09) and wife, Sacred Heart, Minn.
 Dr. T. J. Foster ('09), Monticello, Ill.

Dr. H. D. Larzelere ('09), Janesville, Wis.
Dr. Albert Goodlive ('10), Marshall, Mo.
Dr. S. J. Alcalay ('11), Minneapolis, Minn.
Dr. C. H. Covault ('11), Ames, Iowa.
Dr. A. S. Schlingman ('11), Detroit, Mich.
Dr. C. A. Fast ('12) and wife, Van Wert, Ohio.
Dr. W. F. Guard ('12) and wife, Ames, Iowa.
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Dr. W. A. Barnette ('13), Greenwood, S. C.
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Dr. Jas. D. Grossman ('14), wife and son, Columbus, Ohio.
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Dr. A. W. Munson ('22), Bismarck, N. D.
Dr. L. R. Tweete ('22), Thief River Falls, Minn.
Dr. Lewis H. Moe ('27), Stillwater, Okla.

ONTARIO VETERINARY COLLEGE

The graduates of the Ontario Veterinary College in attendance at the Minneapolis meeting of the A. V. M. A. held their alumni dinner at the New Nicollet Hotel, Tuesday evening, August 7, 1928. There was a good attendance of members and their wives, there being in the neighborhood of 35 present. A very enjoyable time was spent in renewing old friendships and forming new acquaintances with the younger members. Dr. L. A. Merillat presided in his usual capable and genial manner. Dr. E. A. Watson, who has for several years acted as treasurer of the Andrew Smith Memorial Fund, reported that the Fund had now reached a substantial amount and recommended that some definite action be taken in connection with the objects of the Fund. Those taking part in the discussion included Drs. J. I. Gibson, L. E. Day, L. A. Merillat, J. W. Griffith, P. Malcolm and C. D. McGilvray. It was then unanimously agreed that use should now be made of the interest annually accruing on the Fund, and Drs. Merillat, Watson and McGilvray were appointed a special committee to arrange for the procurement of a suitable design for a gold medal, bearing a bust of the late Dr. Andrew

Smith, and to arrange for the annual award of this medal to the student having the best standing at graduation from the Ontario Veterinary College.

The following were in attendance at the dinner:

- Dr. J. I. Gibson ('87) and wife, St. Joseph, Mo.
- Dr. L. A. Merillat ('88), Evanston, Ill.
- Dr. J. W. Elliott ('90) and wife, Aberdeen, S. D.
- Dr. P. Malcolm ('90) and wife, Des Moines, Iowa.
- Dr. J. H. Spence ('90) and wife, Clinton, Iowa.
- Dr. W. F. Crewe ('91), Bismarck, N. D.
- Dr. L. Enos Day ('92), Chicago, Ill.
- Dr. John W. Griffith ('92), Cedar Rapids, Iowa.
- Dr. Fred Evans ('93), wife and daughter, Sioux Falls, S. D.
- Dr. M. J. Kellam ('93), Winnipeg, Man.
- Dr. H. C. Peters ('96), Litchfield, Minn.
- Dr. J. P. Foster ('00), Minneapolis, Minn.
- Dr. C. D. McGilvray ('00), Guelph, Ont.
- Dr. C. A. Mack ('01), Forest Lake, Minn.
- Dr. W. A. Henderson ('02) and wife, Stratford, Ont.
- Dr. J. A. McLeish ('02), Montreal, Que.
- Dr. E. A. Watson ('04), Hull, Que.
- Dr. S. S. Westgate ('06), Grafton, N. D.
- Dr. F. C. Bornschein ('13), wife and son, Merville, Iowa.
- Dr. H. E. Ash ('15), Bowling Green, Ohio.
- Dr. John N. Campbell ('15), Truman, Minn.

UNIVERSITY OF PENNSYLVANIA

Graduates of the University of Pennsylvania in attendance at the Minneapolis meeting of the A. V. M. A. gathered in Parlor Q at the New Nicollet Hotel, Tuesday evening, August 7, 1928, for their annual get-together. The attendance list follows:

- Dr. C. E. Cotton ('93), Minneapolis, Minn.
- Dr. H. W. Turner ('93), New Hope, Pa.
- Dr. C. J. Marshall ('94), Philadelphia, Pa.
- Dr. J. R. Mohler ('96), Washington, D. C.
- Dr. J. T. Hershman ('97), Chicago, Ill.
- Dr. L. A. Klein ('97), Philadelphia, Pa.
- Dr. M. Jacob ('99), Knoxville, Tenn.
- Dr. E. L. Cornman ('00), Marietta, Pa.
- Dr. O. M. Norton ('01), Greenville, Miss.
- Dr. C. S. Shore ('01), Lake City, Minn.
- Dr. B. T. Woodward ('02), New York, N. Y.
- Dr. E. P. Althouse ('03), Sunbury, Pa.
- Dr. Geo. H. Hart ('03), Davis, Calif.
- Dr. Henry Hell ('04), Wilton Junction, Iowa.
- Dr. T. E. Munce ('04), Harrisburg, Pa.
- Dr. Wm. C. Prouse ('07), Minneapolis, Minn.
- Dr. H. Preston Hoskins ('10), Detroit, Mich.
- Dr. W. H. Ivens ('10), Philadelphia, Pa.
- Dr. M. F. Barnes ('11), Harrisburg, Pa.
- Dr. A. A. Feist ('12), St. Paul, Minn.
- Dr. E. F. Ahnert ('13), Omaha, Nebr.
- Dr. J. T. E. Dinwoodie ('13), Aberdeen, S. Dak.
- Dr. C. H. Hofstrand ('13), Churchs Ferry, N. Dak.
- Dr. E. A. Benbrook ('14), Ames, Iowa.

Dr. F. H. Kelly ('18), Goldfield, Iowa.
Dr. H. E. Beister ('19), Ames, Iowa.
Dr. H. E. Moskey ('20), Washington, D. C.

Dean Klein reported upon the happenings of the past year at Old Penn, as well as the outlook for the new year, which was very encouraging in all respects. Dr. John T. E. Dinwoodie, live stock editor of the *Dakota Farmer*, spoke interestingly of his contacts with and observations on the veterinary profession in the role of editor of an agricultural paper. Drs. Jacob and Hoskins rendered interesting case reports in the field of bovine obstetrics, much to the amusement of those present.

Dr. Geo. H. Hart delivered an extremely comprehensive and very scholarly dissertation, entitled, "Modern Views on the Proper Relations which Should Exist Between Teaching and Research in Our Great Educational Institutions, with Special Reference to Animal Husbandry." Dr. Hart had evidently spent a great amount of time in the preparation of his address and his audience showed their deep appreciation by their rapt attention during the entire thirty minutes required to deliver the discourse.

A novel stunt was pulled off in the exchange of felicitations between the Ohio State and Pennsylvania alumni groups, who occupied adjoining rooms. Dr. H. C. H. ("Bud") Kernkamp acted as ambassador extraordinary from Ohio to Pennsylvania and Dr. H. W. ("Hen") Turner capably filled the role of minister plenipotentiary from Pennsylvania to Ohio, much to the enjoyment of both groups.

UNITED STATES COLLEGE OF VETERINARY SURGEONS

Four graduates of the United States College of Veterinary Surgeons got together for dinner at the Nicollet Hotel, Minneapolis, Alumni Night, August 7, 1928.

Dr. C. L. Hall ('10), St. Paul, Minn.
Dr. William Moore ('11), Raleigh, N. C.
Dr. J. N. Holzer ('12), Minneapolis, Minn.
Dr. H. C. Givens ('13), Richmond, Va.

HORSE LAUGH

Said the tractor to the horse,
"I was stricken with remorse
As I pulled the plow today,
Thinking how I now enjoy
Doing what was your employ—"
But the nag just laughed, "Neigh, Neigh!"

—*Farm and Fireside.*

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1928-1929

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MADRID VETERINARY SCHOOL

The *Journal* of the American Medical Association states that in the report of the recent meeting of the building committee of the "University City," the secretary, Don Florestan Aguilar, announced that the bull fight held lately in Madrid for the benefit of the "University City" had cleared 47,500 pesetas. He announced, also, that it has been agreed to include the veterinary school among the buildings of the city. It was agreed that a committee composed of a professor of the veterinary school and an architect should visit the veterinary schools of Leipzig and Munich to collect fundamental principles to be used in the school of Madrid. Those German veterinary schools are considered by the committee to be the best in the world.—*Science*.

It is estimated that domestic fowls in the United States consume more wheat than is exported from the country.

ASSOCIATION MEETINGS

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was held at the Academy of Medicine Building, 103rd St. and Fifth Ave., New York City, May 2, 1928. The meeting was called to order by the President, Dr. C. G. Rohrer. The minutes of the March meeting were read and approved. The Secretary reported on the smoker held at Keen's English Chop House, instead of the April meeting. There was no literary program, the whole evening being devoted to business.

Dr. H. K. Miller opened the meeting by bringing up the following questions for discussion by the Association:

1. Ear-cropping.
2. Advertising in the Red Book.
3. Grading of hospitals.
4. Societies.

The President suggested that the subjects be discussed in the order as suggested by Dr. Miller.

Ear-cropping: The discussion of this subject was all one-sided. The Association unanimously agreed it inhuman to crop ears. It was moved by Dr. O. E. McKim that a committee of three be appointed by the Chair to wait on the authorities at Albany to assist in the formulation of a bill to prohibit ear-cropping. Seconded and so ordered.

Advertising in the Red Book: Dr. H. K. Miller suggested that the funds used for advertising in the Red Book be used to finance veterinary education talks by radio. Dr. R. W. Gannett reported on the Brooklyn veterinarians' attempt to adjust advertising in the Red Book by agreeing the cost should not be over \$75.00. Dr. A. Slawson suggested a "combination" advertisement. Dr. Gannett moved that a committee be appointed to study the advertising situation in the Red Book. Seconded and ordered.

It was now approaching the closing hour and, therefore, the discussion on "Grading of Hospitals" and "Societies" had to be deferred to a later meeting.

The President appointed the following committees: (1) Ear-cropping: Dr. E. R. Blamey, Dr. H. K. Miller and Dr. O. E. McKim. (2) Red Book Advertising: Dr. A. Slawson, C. P. Zepp and another member to be selected.

Dr. Crawford announced the dates of July 11 and 12 for the New York State Veterinary Medical Society meeting to be held at Coney Island.

Dr. G. A. Knapp, of Millbrook, N. Y., was a welcome visitor. Mr. A. C. Goerlich, of Goerlich and Goerlich, gave a short talk explaining liability insurance and rates to veterinarians.

No further business the meeting adjourned.

JUNE MEETING

Instead of the regular monthly meeting, there was a combined meeting of the Long Island Veterinary Society, the Brooklyn Veterinary Society and the Veterinary Medical Association of New York City at Berns' Veterinary Hospital, 59 Lawrence St., Brooklyn, N. Y., June 13, 1928. The meeting was called to order by Dr. C. G. Rohrer, president of the Veterinary Medical Society of New York City.

The speaker for the evening was Dr. Edwin Blamey, of New York City, who gave a talk on unusual cases encountered by small-animal practitioners. Among the interesting cases Dr. Blamey presented was one of a Bassett Hound bitch showing prolapse of the rectum, but upon further examination he found it to be intussusception of the small intestines and inversion of the cecum. Treatment: Reduced intussusception and amputated cecum. Bitch recovered very well and at the same time was carrying eight fetuses.

Some of the other cases were adhesion of cecum to colon; calculi in a bitch, where he operated and removed a number of calculi. The stones continued to be formed and later she passed one. Dr. Blamey suggested treating the kidney condition and they would not recur. Another was an Irish Setter which would vomit about two hours after eating and have acute pain. Final examination revealed it to be an ulcer of the duodenum. In this case Dr. Blamey outlined a very exact and scientific system of diagnosis and treatment through a long period of time until the dog was back to normal health. Dr. Blamey explained that vomiting in Bostons is frequently due to hyperacidity of the stomach. He suggested putting them on a non-acid diet until corrected. Irritation in the eyes of Pekingese is usually due to a

double row of eye lashes. Dr. Blamey suggested that these be removed.

Dr. Blamey's paper was discussed by a large number of veterinarians present, including Drs. Baizler, Chase, Miller, Slawson, Crawford, MacKellar, Rohrer, Goodman, Risley and a number of others. From the questions asked Dr. Blamey and the interest taken in the discussion, one could readily assume it presented many interesting points.

Dr. MacKellar reported on the meeting of the Executive Board of the A. V. M. A., assuring everybody a very good program.

No further business, the meeting adjourned.

C. P. ZEPP, *Secretary.*

FLORIDA STATE VETERINARY MEDICAL ASSOCIATION

The midsummer meeting of the Florida State Veterinary Medical Association was held in the Mirasol Hotel, Davis Islands, Tampa, July 23-24, 1928. The meeting was well attended and the program was carried out in a very able manner.

The meeting was called to order by President F. G. Martin, of Lakeland. Dr. H. M. Clarvoe, of Tampa, gave an address of welcome to Tampa. Dr. C. M. Pollard, of Jacksonville, gave the response to the address of welcome.

Dr. J. G. Fish, Jr., of Jacksonville, gave a discussion on "Municipal Inspection Work." Dr. J. V. Knapp, State Veterinarian, Tallahassee, discussed "Rules and Regulations Governing Interstate Shipment of Cattle from the Tick-Infested Areas of Florida."

Monday afternoon the following program was carried out:

Round-table discussion on diseases of cattle, conducted by Dr. M. J. Ernest, of Tampa.

"Bacillary White Diarrhea in Poultry," by Dr. D. C. Gillis, of Tallahassee.

"Avian Coccidiosis," by Dr. E. F. Thomas, Agricultural Experiment Station, Gainesville.

On Tuesday morning, the session was opened with a discussion of "Municipal Meat Inspection Work," by Dr. Paul Fischer, City Veterinarian of Lakeland.

Following Dr. Fischer's discussion, Dr. W. J. Tanner, of St. Petersburg, gave a paper on "Canine Distemper." Then a round-table discussion on diseases of small animals followed

and Dr. Thos. J. Mahaffy, of Jacksonville, conducted this discussion. The last topic on the program was "Importance of Laboratory Examinations in Making Diagnoses—Practical Demonstrations of Laboratory Specimens," by Dr. J. F. Schubert, of St. Petersburg.

Miami was voted as the next meeting place.

A. L. SHEALY, *Secretary*.

SOUTH CAROLINA ASSOCIATION OF VETERINARIANS

The nineteenth annual meeting of the South Carolina Association of Veterinarians was held at Columbia, July 24-25, 1928. Headquarters were at the Jefferson Hotel. A large and enthusiastic number of veterinarians attended and the meeting was a success in every way. A number of very interesting papers were read and discussed. These afforded valuable information to all present. A pleasant feature of the meeting was the barbecue held at the Shrine Country Club. This was attended by a large number of ladies. The barbecue was followed by swimming and dancing.

M. R. BLACKSTOCK, *Sec.-Treas.*

VIRGINIA STATE VETERINARY MEDICAL ASSOCIATION

The thirty-fifth semi-annual meeting of the Virginia State Veterinary Medical Association was held at the Virginia Polytechnic Institute, Blacksburg, July 31-August 1, 1928. Thirty-five members were in attendance. Twelve of them were accompanied by their wives.

The minutes of the annual meeting and of the special meeting, having been sent to all members, a motion prevailed to dispense with the reading of these minutes. President H. C. Givens introduced Dr. J. A. Burruss, president of the Virginia Polytechnic Institute, who made a very pleasant address of welcome. This was responded to by Dr. George C. Faville.

The subject of hemorrhagic septicemia was informally discussed by Drs. McCoy, Neff, Clemmer and others. Each gave reports of outbreaks with which they had had to deal.

Dean H. L. Price, of the College of Agriculture, gave a most interesting talk, entitled, "Coat Color Inheritance in Setter Dogs." Dean Price's talk was based upon a great deal of study

of pedigrees, as well as experience in breeding dogs, and his conclusions were both interesting and instructive.

Dr. Thomas Owen, of Norfolk, discussed "Diseases of Hogs Other Than Cholera." Dr. O. F. Foley, of Bridgewater, read a very comprehensive paper on "Parasites in Swine."

The evening session was called to order at seven o'clock in the Auditorium of the Y. M. C. A. Building. Professor John R. Hutcheson spoke on "The Need for Well-Trained Veterinarians in Virginia." Prof. Hutcheson knows the need for such men and the need for cooperation between the county agent and the veterinarian. He does not want the county agent to practice veterinary medicine, but rather to aid the veterinarian to meet the needs of the farmer.

Professor C. W. Holdaway, of the Virginia Polytechnic Institute, read a very interesting paper on "Mineral Feeding in Animal Nutrition." He showed that there is much misconception in the use of minerals in nutrition and inference could plainly be seen that there is a good chance for fake mineral foods.

Dr. L. E. Starr, of the Virginia Polytechnic Institute, briefly described the methods to be employed in preparing blood samples for the laboratory.

At the business session, a report was received from the Board of Censors, which met immediately after the afternoon session the previous day. It was the opinion of the Board that the office of secretary-treasurer should be separated and it was moved that a resolution to this effect be introduced by Dr. Faville at the annual meeting, the resolution to define separate duties for the offices of secretary and treasurer. It was moved that the resolution introduced at the annual meeting by Dr. McDonough to do away with the semi-annual meeting be not adopted. This resolution was laid over until the annual meeting. Dr. T. P. Rowe was admitted to membership.

At the morning session, the second day, the Association adopted a resolution of condolence on the death of Dr. John S. Nicholas, of Charlottesville.

Dr. E. W. Price, of the U. S. Bureau of Animal Industry, presented a very interesting paper on "Newer Parasites Found in the South." This paper was full of very valuable information and this will be of great value to the profession.

On motion the Association extended to the college authorities

and to the Local Committee on Arrangements a rising vote of thanks for the entertainment arranged for the Association.

At ten o'clock the meeting adjourned to the shade of the oak tree back of Agricultural Hall and enjoyed a large-animal clinic conducted by Dr. J. P. Hutton, of Michigan State College. Dr. Hutton is very skillful with the knife and his work on large animals was greatly enjoyed. Dr. Herbert Howard demonstrated caudal anesthesia in the cow and Dr. J. T. Wilson performed a spaying operation under spinal anesthesia.

At two o'clock, all the members and the ladies went on an automobile ride to Mountain Lake where they enjoyed a basket picnic. This trip was one of the high spots of the meeting. The meeting as a whole was one of the best in the history of the Association and hearty good fellowship and enthusiasm was enjoyed by everyone.

GEORGE C. FAVILLE, *Secretary pro tem.*

MONTANA VETERINARY MEDICAL ASSOCIATION

The twentieth annual meeting of the Montana Veterinary Medical Association was held at Helena, August 3-4, 1928. There was a good attendance of veterinarians and their families and an optimistic spirit prevailed. In connection with the meeting, there was a conference of all federal veterinarians in the State, and a meeting of all veterinarians employed by the State.

The first day of the meeting was devoted to a business session in the morning and a program of papers in the afternoon. In the evening a dinner for the members and their wives was served at the Montana Club. The morning of the second day was occupied by a clinic. In the afternoon the business was completed and then the Association was entertained by Dr. W. J. Butler, at his summer camp.

The opening address was made by Dr. W. F. Cogswell, secretary of the Montana State Board of Health, who emphasized the close cooperation between the Board of Health and the Livestock Sanitary Board. The retiring president, Dr. N. B. Smith, spoke on the meat and milk inspection ordinances of Billings, where Dr. Smith is a member of the City Council.

Dr. W. E. Logan, of Billings, gave a talk on some interesting historical data in connection with the development of medical

practice. Dr. H. F. Wilkins, of Lewistown, read a paper on "Foot Rot in Sheep."

Dr. R. R. Spencer, Medical Officer in Charge of the Spotted Fever Laboratory, at Hamilton, Montana, addressed the Association on "Tick-Borne Infections of the Northwest Common to Man and Beast." He discussed particularly spotted fever, tularemia, tick paralysis and the condition known as "down with ticks."

Dr. H. B. Raffensperger, in charge of the Zoological Laboratory of the U. S. Range Live Stock Experiment Station at Miles City, Mont., spoke on "Internal Parasites of Domestic Animals." Dr. E. E. Wegner, dean of the College of Veterinary Medicine, State College of Washington, spoke on "Foreign Bodies in the Bovine," describing a new operation for removal of foreign bodies penetrating the reticulum. At the clinic Dr. Wegner demonstrated catheterization of the bovine male.

Dr. Erwin Jungherr, of the Montana State College, demonstrated the diagnosis of the condition of the genital organs in the cow. Dr. Jungherr also demonstrated the method of examining the gastro-intestinal tract of sheep for parasites.

Dr. Howard Welch, of the Montana State College, demonstrated the proper technic for making postmortem examinations of large animals. Dr. A. E. Evans, U. S. inspector-in-charge of meat inspection at Butte, demonstrated the postmortem examination of a tuberculin reactor.

At the closing business session, Dr. J. W. Kilpatrick, of Hamilton, was elected president for the coming year. Dr. I. W. Vinsel, of Baker, was elected vice-president and Dr. H. Marsh, of Helena, was re-elected secretary-treasurer. Dr. J. W. Murdoch, of Helena, was elected to fill a vacancy on the Executive Board. Missoula was selected as the meeting place for 1929.

HADLEIGH MARSH, *Secretary.*

HUDSON VALLEY VETERINARY MEDICAL SOCIETY

The regular quarterly meeting of the Hudson Valley Veterinary Medical Society was held at Kenozia Lake, N. Y., August 8, 1928. About fifty were in attendance.

The principal speaker was Dr. M. J. King, Director, Research Laboratory, Metropolitan Life Insurance Company, Mount McGregor, N. Y., who discussed contagious abortion in cattle and its relation to undulant fever in man. Dr. King reported some

interesting results from the examination of patients under his supervision. By making agglutination tests he found that thirteen per cent of the inmates of the institution reacted and examination of the herd of cattle supplying milk to these patients showed a high percentage of reactors. The number of cows actually eliminating *B. abortus* in the milk, however, was less than one-half of the total reacting. One animal eliminating the organism failed to react to the test. Dr. King stated that this observation had also been made by other investigators. He also reported that after pasteurization of the milk was begun no new reactors had been found among the inmates. This result also had been reported by other workers.

In the opinion of Dr. King, the pasteurization of the milk was necessary for the protection of the human consumer and raw milk produced even under the most elaborate sanitary surroundings did not offer full protection. Several cases of undulant fever were cited and in some of these a diagnosis of tuberculosis, typhoid fever, or some other disease had been made first. The history of every case indicated that the patient had taken milk from herds where abortion disease had existed, or where cows had later been found to be harboring *B. abortus* infection.

Dr. King discussed the difference between *B. abortus* and *B. melitensis* and their respective cultural characteristics. He explained the necessity of animal inoculation to differentiate between the two organisms and the difficulty in some instances of clearly determining to which type the organism belonged. Reference was made of the danger to laboratory workers and several instances of accidental infection were mentioned. Variations in test results were discussed and the opinion was expressed that there was much work yet to be done in standardizing methods and procedure. Dr. King reported that vaccination of cattle using living organisms had proven beneficial, in his opinion.

A spirited discussion of this subject followed and questions also were asked relative to the B. C. G. treatment for tuberculosis. Dr. King showed his familiarity with this subject and gave some valuable and interesting data. President McCartney then expressed his appreciation, as well as that of the Society, to Dr. King for the valuable and interesting contribution he had made to the knowledge of those present and a rising vote of thanks was given for the excellent address he had delivered.

J. G. WILLS, *Sec.-Treas.*

NORTHEASTERN PENNSYLVANIA VETERINARY MEDICAL CLUB

The regular bi-monthly meeting of the Northeastern Pennsylvania Veterinary Medical Club was held on August 23, 1928, at the Montrose Beef Company, Pittston, at which time the members were the guests of the above concern, who furnished a beef-steak dinner at the American Legion Building, West Pittston. The dinner was served by Mrs. John Stutz in a very elaborate manner. After dinner, the ladies were entertained by Mrs. D. O'Shea, wife of the president of the Montrose Beef Company, while the veterinarians motored to the abattoir of the concern and held their regular meeting and received a talk from Dr. M. J. Harkins, of the Veterinary Department of the University of Pennsylvania, on "Immunology and Chemotherapy of Some of the Common Infectious Diseases." Dr. S. E. Bruner, who is in charge of tuberculosis eradication, for the Pennsylvania Bureau of Animal Industry, also gave a very interesting discourse. These talks were instructive to all present. Other veterinarians from the Pennsylvania Bureau of Animal Industry also joined the discussion.

T. D. JAMES, *Secretary.*

McLEAN COUNTY VETERINARY MEDICAL ASSOCIATION

The summer meeting of the McLean County (Ill.) Veterinary Medical Association was held at Miller Park, Bloomington, July 20, 1928. The program consisted of the following papers and addresses:

"Overheat vs. Sunstroke," Dr. N. I. Stringer, Wenona.

"Canadian Thistle-Spray Poisoning," Dr. C. B. White, Stanford.

"Rabies," Dr. E. M. Marquadt, Bloomington.

"The Newer Problems of Our Laboratories," Dr. Robert Graham, Urbana.

A picnic dinner for the members and their families followed the meeting.

PERSONALS

Dr. George Gordon (Chi. '14) has opened a new veterinary hospital at 8210 South Ashland Ave., Englewood, Illinois. It is reported that the new hospital represents an investment of \$35,000.

Dr. Peter Garside (Chi. '10), of Bourbon, Ind., has gone south for his customary annual sojourn. Dr. Garside will be located at 237 S. Grandview Ave., Daytona Beach, Florida, during the winter months.

Dr. C. L. Woolard (Chi. '17), of Benton, Ill., has been engaged as Montgomery County (Ill.) Veterinarian by the Board of Supervisors at a salary of \$3,600 per year, with an allowance of \$400 for the expenses of his office.

NECROLOGY

WILLIAM SHEPPARD

Dr. William Sheppard, of Orlando, Florida, died at his home, August 25, 1928, after an illness extending back over a year.

Born in England, 79 years ago, Dr. Sheppard was a graduate of the Royal College of Veterinary Surgeons, London. For many years he practiced at Sheepshead Bay, Brooklyn, N. Y., and was prominent in Thoroughbred and racing circles. While firing a horse, about twenty years ago, Dr. Sheppard received a kick, which affected the auditory nerves and finally resulted in almost total deafness. He removed to Florida about five years ago.

Dr. Sheppard joined the A. V. M. A. in 1907. He is survived by his widow and one brother.

JOHN CHARLES GENSBURG

Dr. John C. Gensburg, of Pittsburgh, Pa., aged 34 years, died in Passavant Hospital, Pittsburgh, August 31, 1928, after an illness of ten days, the result of a streptococcic infection of the nose and face. Dr. Gensburg started his veterinary studies at Michigan State College and finished at Ohio State University in 1920. He established a very lucrative small-animal practice in Pittsburgh. Dr. Gensburg's will provided that his veterinary library and instruments go to the Ohio State University. His parents and four brothers survive.

J. A. W.

GEORGE WILLIAM CLARK

Dr. George W. Clark, of Sunnyside, Wash., died suddenly, September 8, 1928. An attack of angina pectoris is reported to have been the cause of his death. He was believed to have been in good health up to the day before his final illness.

Born in Roslyn, Wash., thirty-nine years ago, Dr. Clark attended the State College of Washington and received the degree of D. V. S. in 1912. He was associated in practice with Dr. Robert Prior, in Yakima, in 1915 and 1916. He enlisted in the Army during the late war and served overseas, with the army of occupation, with rank of first lieutenant. Later he became interested in ranching in the Yakima Valley and the Sunnyside

district. In 1926 he entered the employ of the State, as deputy veterinarian.

Dr. Clark joined the A. V. M. A. in 1922. He was a member of the Washington State Veterinary Medical Association and the American Legion. He was a very conscientious worker and his death will be a marked loss to the veterinary profession. His widow, step-father and one cousin are the only surviving relatives.

R. P.

ARTHUR HOBBS

Dr. Arthur Hobbs, at one time veterinary inspector in the Northwest Mounted Police Force, stationed at Calgary, and later attached to the Meat Inspection Division, Health of Animals Branch, Canada Department of Agriculture, at Winnipeg, died at Ponoka, Alta., September 15, 1928. Dr. Hobbs was a graduate of the Ontario Veterinary College, class of 1899.

FRED E. PIERCE

Dr. Fred E. Pierce, of Los Angeles, Calif., died suddenly at his home, September 26, 1928. He was sixty-two years of age. Dr. Pierce was a graduate of the Chicago Veterinary College, class of 1889. He located in Oakland, Calif., about 1890, and practiced there until about 1900, when he removed to Los Angeles. Here he entered the firm of Pierce Brothers, pioneer Los Angeles undertakers. He was president of the firm when he died. He was president of the California State Board of Embalmers and past exalted ruler of the Los Angeles Elks' Lodge. Dr. Pierce is survived by five brothers and two sisters.

H. S. WRIGHT

Dr. H. S. Wright, of Greensburg, Pa., aged 68, died suddenly, August 21, 1928. He was a registered non-graduate practitioner and had just returned home from a vacation in the East.

JULIUS W. SCHEIBLER, SR.

Dr. J. W. Scheibler, Sr., of Memphis, Tenn., died at his son's home, in Memphis, October 5, 1928. The cause of death was a paralytic stroke, suffered two days previously and the second in two weeks. On August 22, he was in an automobile accident and was thrown violently against the steering-wheel of his

machine. It is believed that the two strokes were sequelae of the injuries received in the accident.

Born in Richmond, Indiana, February 22, 1864, Dr. Scheibler came to Memphis with his parents when he was two years old. He attended local schools and the University of Tennessee, at Knoxville. He received his veterinary education at the American Veterinary College, from which he was graduated in 1885. He remained at the institution for a year as resident surgeon and then returned to Memphis and established one of the largest veterinary practices in the South. He built and equipped the first veterinary hospital in Tennessee and served as city veterinarian continuously from 1892 until his death. For many years he was president of the Tennessee State Board of Veterinary Medical Examiners, resigning in 1921. He was state veterinarian during the administration of Governor Robert L. Taylor.

Dr. Scheibler joined the A. V. M. A. in 1885 and, at the time of his death, was one of two remaining members who joined that year, the other being Dr. W. G. Hollingworth, of Utica, N. Y. Dr. Scheibler was an active member of the Tennessee State Veterinary Medical Association and served one year as president. He also held membership in the Memphis Newspaper Men's Club, the First Methodist Church and several local civic organizations.

The high esteem in which Dr. Scheibler was held locally was reflected by the following editorial tribute by the *Memphis Press Scimitar*:

Few men in Memphis had a larger acquaintance or more real friends than Dr. Julius W. Scheibler, Sr.

He made friends for friendship's sake and not with an eye to what they could mean to him in a social or business way.

He never was too busy for a hearty handclasp and a pleasant smile. He was the kind of man who ever had a kindly interest in his fellow man. He sympathized with them in their adversities and rejoiced in their successes, but their fortune or misfortune never made any difference in the relationship to him.

His passing will be mourned by all who knew him as a true Southern gentleman.

Dr. Scheibler is survived by his widow and one son, a veterinarian, Dr. Julius W. Scheibler, Jr. The funeral services were under Masonic auspices.

LINK GRIGSBY

Dr. Link Grigsby, of Walkerton, Indiana, died at North Liberty, Indiana, October 16, 1928, following injuries received in an automobile accident on the Liberty Highway, near the latter place. Dr. Grigsby was born in Hartford, Conn., August

4, 1879. He was graduated from the St. Joseph Veterinary College in 1918 and joined the A. V. M. A. the following year. He was in general practice.

HOMER ALBERT McINTIRE

"To dance enjoyably to the rhythmic strains of an orchestra, to feel the exhilaration inspired by music, to walk happily from the dance floor, only to die at its entrance—that is an easy and enviable way to leave this world. And that is the way Dr. H. A. McIntire, of Maquoketa, died last evening in Cedar Rapids."

The above paragraph, taken from the Cedar Rapids (Iowa) *Evening Gazette*, describes the tragic end of one of Iowa's foremost veterinarians, October 17, 1928, while attending the annual meeting of the Eastern Iowa Veterinary Association.

Born in Indianapolis, a little more than fifty years ago, Dr. McIntire received his veterinary training at Iowa State College. He was graduated in 1902 and practiced at Maquoketa ever since. He had not enjoyed good health for more than a year.

Dr. McIntire joined the A. V. M. A. in 1917. He was a past president of the Eastern Iowa Veterinary Association and a member of the Executive Committee. He is survived by his widow, one daughter and three sons.

PERSONALS

MARRIAGES

Dr. Lee McDowell Esh (U. P. '28), of Philadelphia, Pa., to Miss Katheryne Aiken, of Yeagertown, Pa., August 10, 1928, at Media, Pa.

Dr. Warren P. S. Hall (Mich. '20), of Toledo, Ohio, to Miss Marguerita Ellen Ward, of Columbus, Ohio, October 13, 1928, at Columbus, Ohio.

BIRTHS

To Dr. and Mrs. E. C. Jones, of Los Angeles, California, a daughter, September 23, 1928.

To Dr. and Mrs. L. H. Conlon, of Towanda, Pa., a daughter, Oct. 11, 1928.

PERSONALS

Dr. R. V. Gibbons (Corn. '25) has entered general practice at Clyde, N. Y.

Dr. B. L. Strohl (Ind. '08) has been re-engaged as Edgar County (Ill.) Veterinarian.

Dr. Harry Wenborne (Ohio '94) has removed from Wauwatosa, Wis., to Allenton, Wis.

Dr. Ray O. Porter (K. C. V. C. '09) has removed from Holdrege, Neb., to Kearney, Neb.

Dr. J. A. DeSerpa (San. Fran. '10), has been appointed City Health Officer of Ventura, Calif.

Dr. L. N. Peterson (Chi. '10), formerly of Center, Colo., is now located at Canon City, Colo.

Dr. F. I. Reed (Corn. '26) has purchased the practice of Dr. H. W. Naylor (Corn. '13), at Morris, N. Y.

Dr. E. M. Aldrich (U. P. '13), of Watertown, Mass., has removed to Waverly, Mass. Address: 26 Harriet Ave.

Dr. George C. Moody (Ont. '85), of Mason, Mich., has been appointed Ingham County (Mich.) Veterinarian.

Dr. Walter Shaw (Ont. '81), of Dayton, Ohio, recently opened a new veterinary hospital at 533 West Third St.

Dr. H. W. Naylor (Corn. '13), of Morris, N. Y., is engaged in the manufacture of veterinary specialties at that place.

Dr. M. L. Boevers (Iowa '24) has requested a change of address from Lanett, Ala., to P. O. Box 2261, Auburn, Ala.

Dr. Carl J. Wallen (O. S. U. '23) gives us a change of address from Redlands, Calif., to 120 West Gilbert St., Glendale, Calif.

Dr. G. W. McNutt (Iowa '17), of Clear Lake, Iowa, has accepted a position at the State College of Washington, at Pullman.

Dr. Don McMahan (Ind. '02) is secretary of the North Dakota Federation of Cooperative Livestock Shippers, Fargo, N. D.

Dr. James W. Robertson (Chi. '12), formerly mayor of Georgetown, Ohio, has entered general practice at Portsmouth, Ohio.

Dr. G. W. Cliffe (Ohio '92), of Upper Sandusky, Ohio, has disposed of his practice to Dr. A. E. Bixler (Ohio '16), of Rawson, Ohio.

Dr. C. P. Brose (O. S. U. '27), of Belle Center, Ohio, has removed to Portsmouth, Ohio, and opened a veterinary hospital at that place.

Dr. F. R. Allerton (K. S. A. C. '25) is now in the employ of the California State Department of Agriculture and is stationed in Los Angeles.

Dr. F. A. Humphreys (Ont. '19), formerly located at Govan, Sask., has accepted a position at the Veterinary Research Station, Hull, Que.

Dr. Paul S. Dodd (Ind. '18), of Kansas, Ill., has accepted the position of Coles County (Ill.) Veterinarian and has removed to Charleston, Ill.

Dr. W. C. Bateman (Ind. '13) has been appointed San Bernardino County (Calif.) Veterinarian. This county is the largest in the United States.

Dr. Paul S. Dodd (Ind. '18), of Westfield, Ill., has been employed as Coles County (Ill.) Veterinarian for the period of one year, from October 1, 1928.

Dr. J. R. Taylor (Chi. '04) resigned his position with the Illinois State Department of Agriculture and has located for general practice at Sullivan, Ill.

Dr. G. W. Derrick (Corn. '17), who has been engaged in veterinary research work at Cornell University, has located at Elbridge, N. Y., for general practice.

Dr. D. N. Voetberg (Iowa '27), of Grundy Center, Iowa, recently purchased the practice, office and equipment of Dr. L. L. Diller (Chi. '02), at Traer, Iowa.

Dr. E. M. Alderman (K. C. V. C. '14), who has been at the Michigan State College, East Lansing, for the past year, is now located in Yazoo City, Miss.

Dr. A. G. Gierke (Corn. '17) has given up his practice at Clyde, N. Y., and has accepted a position as assistant in veterinary research at Cornell University.

Dr. J. F. Adey (K. S. A. C. '23), of Topeka, Kans., is employed by the Kansas State Board of Agriculture in the capacity of Deputy State Dairy Commissioner.

Dr. A. T. Thompson (O. S. U. '28), of Columbus, Ohio, has accepted a position in the Pennsylvania Bureau of Animal Industry Laboratory, Harrisburg, Pa.

Dr. Kenneth W. Keyes (Corn. '27), formerly of Concord, N. H., is now located at Whitehall, N. Y., in the employ of Borden's Farm Products Company, Inc.

Dr. V. H. Miller (O. S. U. '24), who was in practice during the summer at Marengo, Iowa, has located at Ottawa, Ohio, where he expects to remain permanently.

Dr. H. E. Marshall (Ind. '15), who has been engaged in tuberculin-testing with the Illinois State Department of Agriculture, has returned to private practice at Oblong, Ill.

Dr. A. Savage (Corn. '14) has resumed his duties as pathologist at the Manitoba Agricultural College, after an absence of a year, spent in postgraduate work in Edinburgh, Scotland.

Dr. Warren B. Rawlings (U. P. '28) formerly of Philadelphia, is now located at Swiftwater, Pa., where he is employed by the National Drug Company and also conducts a general practice.

Dr. J. W. Benner (K. S. A. C. '11), of the N. Y. State Veterinary College, Cornell University, is taking postgraduate work at the College of Veterinary Medicine, Ohio State University.

Dr. J. G. McKee (A. P. I. '26), formerly with the North Carolina Department of Agriculture, is now engaged in tuberculosis eradication work in South Carolina, with headquarters at Columbia.

Dr. D. R. Herberich (Chi. '20), formerly of Kempton, Ill., is now operating a dog and cat hospital at 1310 West 79th St., Chicago, Ill. Dr. Herberich opened his new hospital on September 22.

Dr. R. L. Hectorne (Ohio '28), of Avon, Ill., has accepted an appointment in the Department of Animal Pathology, at the University of Illinois, as an assistant to Dr. Robert Graham (Iowa '10).

Dr. I. R. Cooper (A. P. I. '16), who has been engaged in tuberculosis eradication work in North Carolina, has gone to Columbia, South Carolina, where he is now occupied in the same line of work.

Dr. John B. Hagenbuch, Jr. (U. P. '28), of Philadelphia, Pa., has accepted a position with the Walker-Gordon Laboratory Company, at Plainsboro, N. J., as a member of the veterinary staff of the Company.

Dr. Russell G. McNellis (Iowa '28), of Janesville, Minn., has accepted an appointment as Junior Veterinary Sanitarian in connection with the Federal Import Milk Act and is stationed at Rouses Point, N. Y.

Dr. C. A. White (Chi. '94), of Los Angeles, Calif., accompanied by Mrs. White, returned home about the middle of October from a trip to England. While abroad Dr. White visited a brother who is a veterinarian.

Dr. I. E. Newsom (K. S. V. C. '09-San Fran. '06), of Fort Collins, Colo., was elected grand master of the Grand Lodge, A. F. & A. M., of Colorado, at the sixty-eighth annual meeting of the order, held in Denver recently.

Dr. W. J. Butler (N. Y.-Amer. '03), state veterinarian of Montana, addressed the Montana Public Health Association, at Canyon Hotel, Yellowstone Park, August 27, 1928, on the subject, "Progress Report on Tick Parasite Work."

Dr. S. H. Keston (McK. '14), who has been located in Winnipeg, where he was attached to the Health of Animals Branch, Canada Department of Agriculture, has been transferred to Ottawa, for work in the Pathological Division.

Dr. M. E. Gouge (K. C. V. C. '10), of Sedalia, Mo., was in charge of the ceremonies in connection with the laying of the cornerstone of the Elks' new home at Sedalia, October 14. Dr. Gouge is Exalted Ruler of the local body, which now numbers 350 members.

Dr. F. E. McClelland (Corn. '09), of Buffalo, N. Y., accompanied by Mrs. McClelland, spent several weeks in Europe the past summer. While abroad they visited Scotland, England, Holland, Belgium and France. They were away from July 12 until August 16.

Dr. C. M. Carpenter (Corn. '17) has resigned his position at the N. Y. State Veterinary College, at Cornell University, and has accepted a position at the Union Medical School, Albany, N. Y., where he will work toward a degree in medicine and will carry on bacteriological research work.

Dr. Hubert Shull (Ont. '16), of Texarkana, Ark., was "lionized" by the Lions Club of his city at the recent "Governor's Day" luncheon. Dr. Shull was showered with tributes for his manhood, traits of character, genius, accomplishments, and many other things which contributed to make him such a valuable member of the organization.

Dr. R. A. Whiting (Corn. '05), who has been a member of the veterinary staff of Purdue University for the past eighteen years has resigned his position and gone to San Diego, Calif., to accept the position of director of veterinary research for the San Diego Zoological Society and the San Diego Poultry Association. The San Diego zoo is one of the largest in the West.

Dr. Roger S. Amadon (O. S. U. '16), of the University of Pennsylvania, came out victor in a tussle with an eight-foot shark while fishing in Delaware Bay during his vacation. The battle with the shark lasted for an hour and, for good measure, Dr. Amadon hooked into and landed three drum-fish that weighed thirty-five pounds each. Not so bad for a fresh-water angler!

Dr. William M. Hickman (Cin. '18), of Covington, Ky., has been appointed veterinarian to have charge of the testing of dairy cattle in Kenton County, Ky. Dr. Hickman will be allowed a salary of \$2,000 a year, of which Kenton County will pay sixty per cent and the City of Covington the balance. Dr. Hickman will work under the supervision of Dr. L. H. Crisler (Ohio V. C. '94), city food inspector.

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